FOOD MANUFACTURE

Incorporating Food Industries Weekly

LEONARD HILL LIMITED, STRATFORD HOUSE, 9 EDEN STREET, LONDON, N.W.1 SEPTEMBER 1, 195

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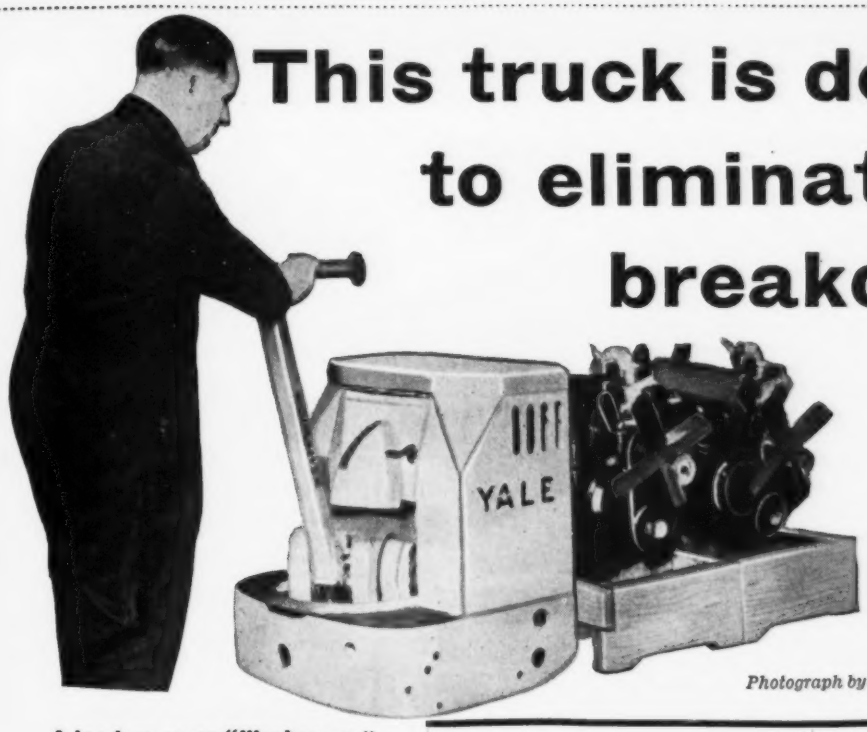
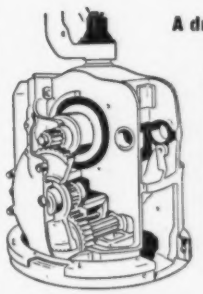
This truck is designed to eliminate breakdowns



Photograph by courtesy of Humber Ltd., Coventry

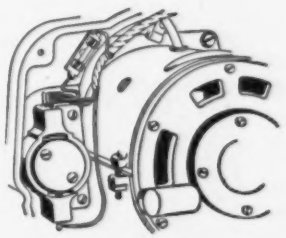
A load on your "Worksaver" is a load off your mind!

When mechanical handling equipment lies idle—waiting for attention or spares—production costs *shoot* up.
Invest in a "Worksaver": put it to work and compare its trouble-free service with any of your other trucks. Then you'll understand why so many plants—large and small—are changing to Yale.
The "Worksaver" is available in Fork Lift, Pallet, Platform and Tractor models.



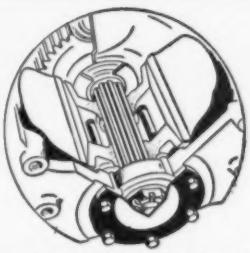
A drive unit that lasts a lifetime

This powerful, robust drive unit will stand up to a lifetime of rough handling. Gears are drop-forged nickel-chrome-molybdenum steel, heat-treated and mounted on ball bearings, operating in oil. Entire drive unit is enclosed and floats on 105 ball bearings.



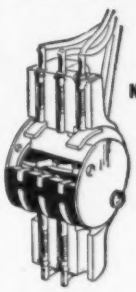
Simple to change brushes

Drive motor of a high torque series wound type, specially designed for easy cleaning and adjustment.



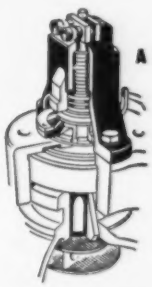
Split hub eliminates pressing in tyres

Worn-out tyres can be quickly replaced by using hand tools—an exclusive Yale feature.



No frayed, broken wires

On the "Worksaver", all flexing, chafing and bending of wires is eliminated. Slip rings are built into the base of the handle so that wiring cannot be twisted or bent, no matter how the handle is turned or lifted.

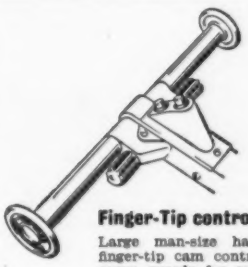


A capstan built to take the load and more

The load-carrying tapered roller bearing ensures perfect alignment of the unit. The power line is carried through silver contacts. Wires cannot bend whatever the angle of the turn.

Fully protected—easily accessible

The head and heart of the "Worksaver" is fully protected, yet easily accessible for adjustments and inspection. It can be removed from the truck in five minutes.



Finger-Tip control

Large man-size handles with finger-tip cam controls. Ends carry guards for safety. Two speeds forward and two reverse. Lift control and horn button in easy finger-reach position.

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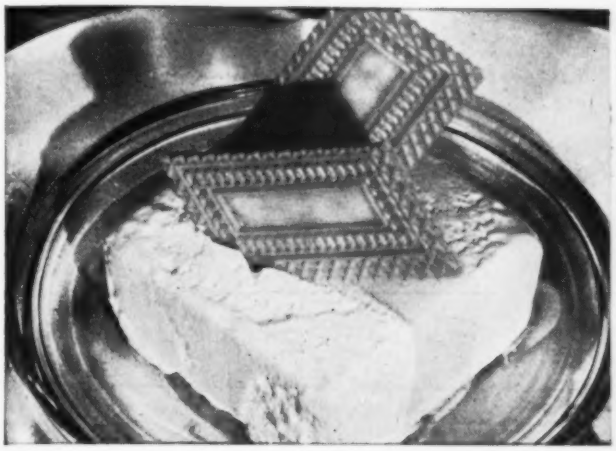

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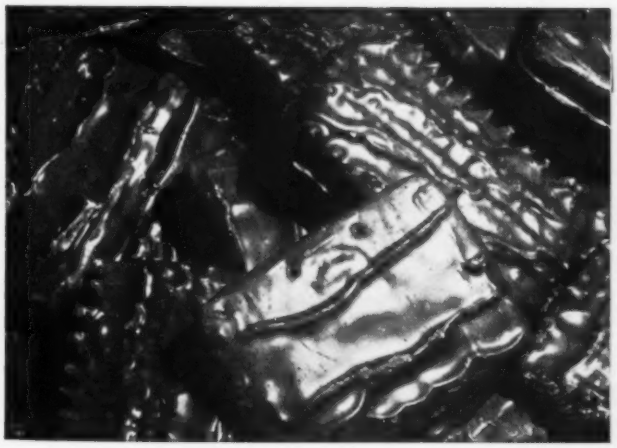

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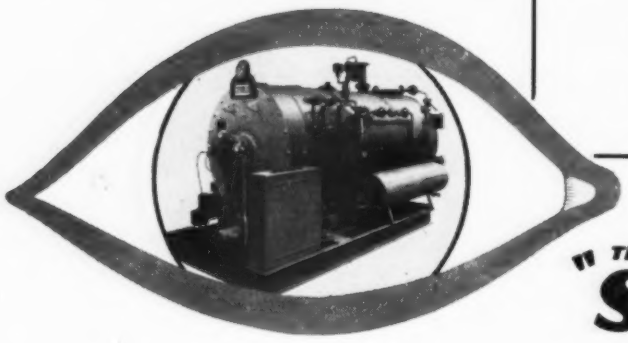

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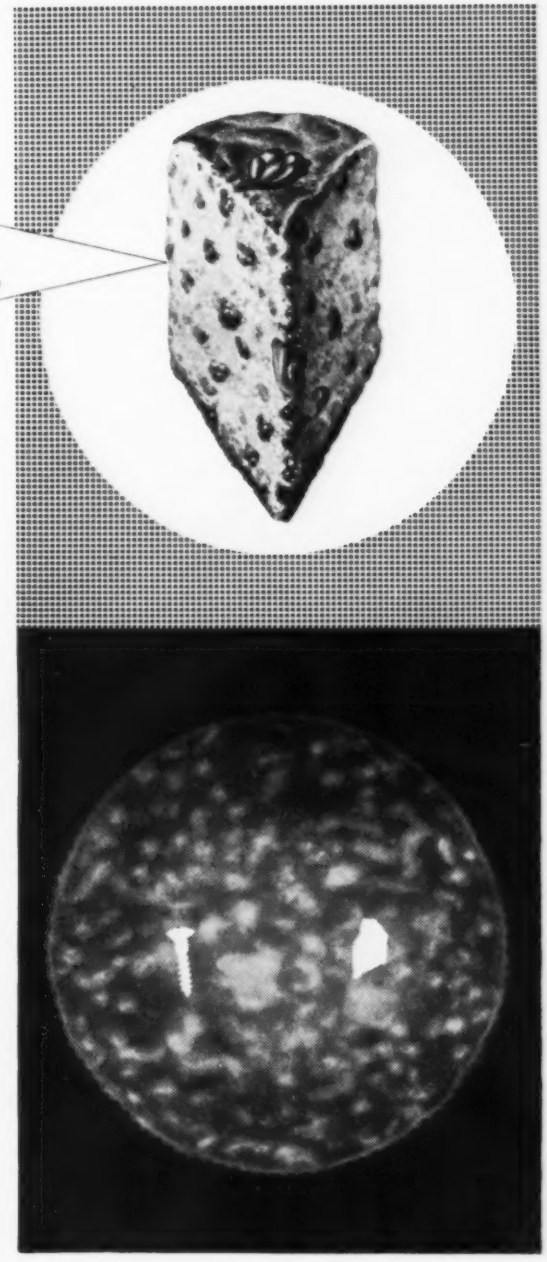

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(PXI0114)

TO ALL USERS OF GUM TRAGACANTH

Get the right

consistency

consistently

with

RED CARNATION

BRAND

POWDERED GUM TRAGACANTH

RED CARNATION Powdered Gum Tragacanth has certified viscosity, colour and fineness of powder. The variations and imperfections present in Gum Tragacanth in its natural state have been eliminated. After grading the different types of Gum, Kimptons carefully process it, ensuring that each of the four grades available has standard, unvarying characteristics. You can be sure that every consignment is identical (no need to analyse it before use!). You can also be sure that the Gum Tragacanth you receive will be fresh; and because it is packed in airtight tins it will *stay* fresh.

KIMPTON BROS. LTD., (*Established 1882*) 110 FENCHURCH STREET, LONDON, E.C.3 ROYal 5544 (5 lines)

MADE TO MEASURE

Kegs, Flat and Taper-top Drums and all types of Tin Plate Containers.

JOHN FEAVER

CONTAINERS MADE TO YOUR REQUIREMENTS

JOHN FEAVER LTD., 120 TOWER BRIDGE ROAD, LONDON, S.E.1

Telephone: BERmondsey 1753 *Telegrams:* Tinplate, Souphone, London

"You'll find you've a really even surface with Stelcon Floors"

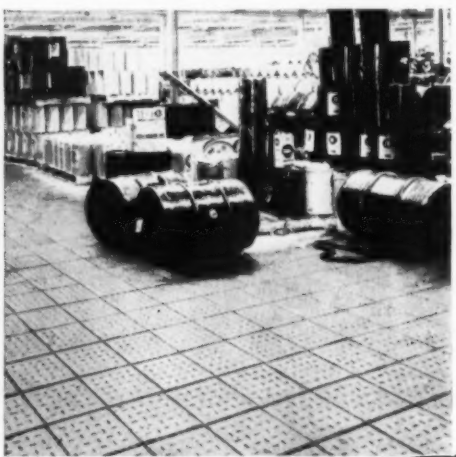
Everything goes more quickly and more easily on a smooth level floor surface. Stelcon Floors retain their surface, even under the heaviest traffic. Dustless, hygienic and extremely strong, Stelcon Anchor Steel Plates and Steel Clad Flags provide the perfect floors for modern industry. That's why so many people are installing them nowadays. *Full details sent on request.*

You'll find

Stelcon

FLOORS

in every industry —everywhere



A floor of STELCON ANCHOR STEEL PLATES Reproduced by courtesy of Shell-Mex & B.P. Ltd. Barton Installation, Manchester, 17.

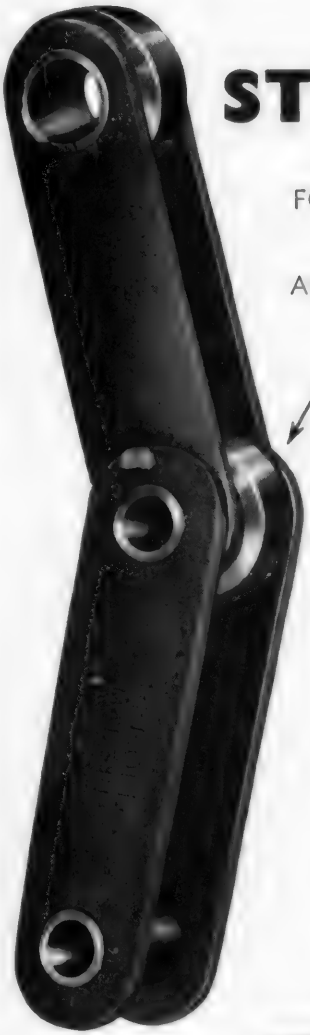
STELCON (INDUSTRIAL FLOORS) LTD., CLIFFORDS INN, LONDON, E.C.4. TELEPHONE: CHAncery 9541

No. 1 of a series of 6 advertisements

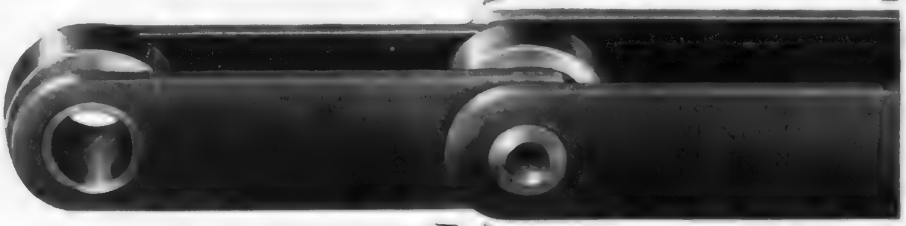
RENOLD

BASIC*

STEEL CHAINS FOR CONVEYORS AND ELEVATORS



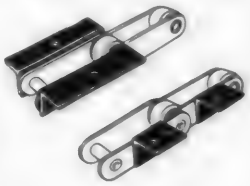
*HOLLOW BEARING PIN CHAIN



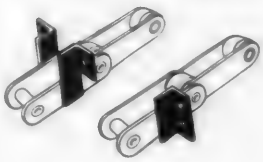
*SOLID BEARING PIN CHAIN

STOCK RANGE of chains and wheels up to 15,000 lb. breaking load. Range of attachments available, as illustrated, for fitting to basic chains at intervals as required.

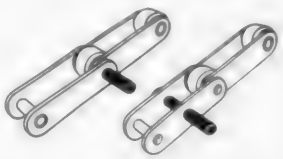
'K' ATTACHMENTS



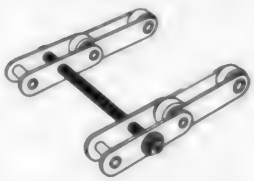
'F' ATTACHMENTS



SPIGOT PINS



STAY BARS



BIPLANAR LINKS

A CHAIN FOR EVERY DUTY

Write for Catalogue Ref. 220/25/16F

RENOLD CHAINS LIMITED · MANCHESTER

Transmission and Conveying Chains, Wheels and Accessories for all mechanical purposes.

worth thinking about

—*How to increase your Sausage & Cooked Meat Trade!*

M.S.B

THE PERFECT ADDITIVE

for all Sausage Products and Small Goods

M.S.B. is a GUARANTEE of consistency in the manufacture of *all* qualities and types of sausage especially during hot and variable weather conditions.

M.S.B. overcomes the "human element" in that it guarantees consistency with every chopping.

M.S.B. stops shrinkage and loss of weight during cooking.

M.S.B. improves colour and cutting texture of your Luncheon Sausage and Polony.

M.S.B. means more fat for better quality sausage.

M.S.B. manufactured by FOODTECH LTD.

REGISTERED TRADE MARK

HYPAK

BRAND

Self Coloured CASINGS

PRINTED WITH YOUR NAME

HYPAK self-coloured, Printed Casings give maximum eye-appeal, are easy-to-handle and are designed to give maximum strength and uniformity. These famous casings are available in red, amber, cream, black and transparent, and can be printed with individual designs to suit your requirements.
There is a wide range of sizes for all sausage and cooked meat products. Samples and further details will gladly be sent on request.

* *Post Coupon Today*

THE OPPENHEIMER CASING CO. (U.K.) LTD.

159-165 HARROW ROAD, LONDON W.2 ***Phone PADdington 7431-5***

Name .....

Address .....

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FM.9 55

Please rush me free and without obligation sample of M.S.B. and details of prices for quantity

Please rush me free and without obligation samples of suitable Hypak Self-Coloured Casings

For ..... Product

Scottish Sales Depot: THORNYBAUK, FOUNTAINBRIDGE, EDINBURGH 3. Fountainbridge 1403

You can't afford to ignore the economies of using

DE LAVAL

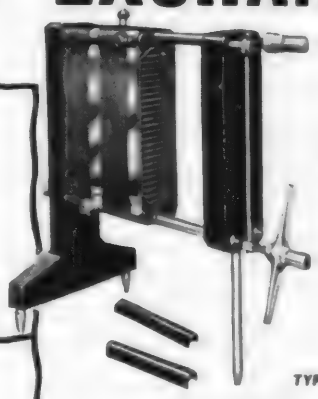
PLATE HEAT EXCHANGERS

OVER 200 BREWERIES use DE LAVAL HEAT EXCHANGERS for

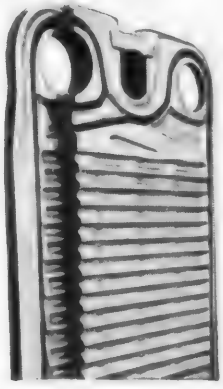
Cooling wort
Beer chilling
Beer Pasteurisation
Return Beer Pasteurisation
Sugar Primings cooling and heating

OVER 100 YEAST FACTORIES AND DISTILLERIES use DE LAVAL for

Pasteurising and Cooling Molasses
Cooling of Yeast Cream
Cooling of Spent Wash
Continuous Cooling of fermented wort
Recovery of heat



TYPE PSEB



PROFILE OF PLATES

Special features of

DE LAVAL HEAT EXCHANGERS

- ★ Sturdy heavy guage stainless plates
- ★ Deep gasket grooves, giving leak proof operation at high pressures
- ★ Easily and quickly cleaned without dismantling

PIS FOR HIGH CAPACITIES AND PRESSURES

FISH OIL—VEGETABLE OIL AND MARGARINE FACTORIES use DE LAVAL for

Glue water heating before separation and cooling after separation—Heating vegetable oil in refineries—Cooling deodorised and hardened oils—Sterilising reconstituted and fresh milk—Pasteurising margarine

also for

Pasteurising fruit juices and wine—Cooling vinegar wort and heating vinegar—Heating and cooling gelatine—Heating starch milk—Cooling Protein slurry—Condensing and cooling distillate—Pre-heating still feeds—Heating and cooling viscose—Cooling waste sulphite liquor—Pasteurising penicillin media Etc Etc

UNSURPASSED FOR HEAT TRANSFER EFFICIENCY

One factory now saves 3 tons/hour of coal since installing De Laval

Write for complete details to Process Engineering Division

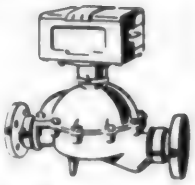
ALFA-LAVAL CO., LTD. · GREAT WEST ROAD · BRENTFORD · MIDDLESEX

Smee's DL 323

Liquid process control by **MEASUREMENT**

1½" S 7. stainless steel meter with screw on flanges and 12" vertical index.

When you require to measure bulk or batch quantities of edible liquids, oils, spirits and solvents, hot or cold water, we can supply meters with summating, resettable, electrical presettable, direct reading or pointer type index attachments (as illustrated) and control equipment.

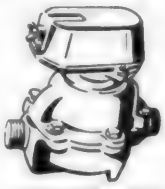


BOX TYPE COUNTER

Re-settable batch-dispensing counter with 7-digit cumulative total register.

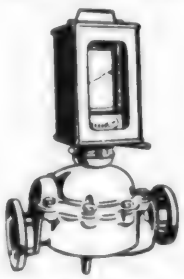
6" VERTICAL RE-SETTING INDEX

Can also be used to pre-set a determined quantity, with electric trip to operate solenoids pumps, warnings, etc.



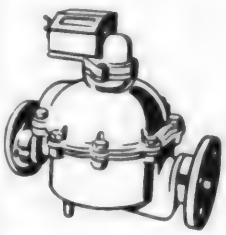
ZEROSET INDEX

Simple turning motion re-sets indicator to zero.



MECHANICAL RECORDER

Gives a graphic record on 5" x 13" chart; suitable for 4 hour, 8 hour, 1 day, 7 day periods



PREDEX CONTROLLER

Automatic means for continuous dispensing of fixed quantities of liquids.

MEASUREMENT

INDUSTRIAL **LIQUID** *METERS*

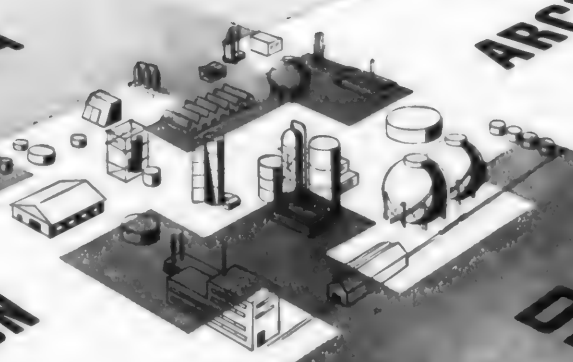
(A COMPANY OF THE PARKINSON & COWAN GROUP)

MEASUREMENT LTD. HYDRAULICS DIVISION
119 Union Street, Oldham, Lancs. Telephone: Main 6432.
LONDON: TERMINAL HOUSE, Grosvenor Gardens, London, S.W.1.
Telephone: SLOane: 0111.

fully interlocked

MANAGEMENT

ARCHITECTURE



CONSTRUCTION

DESIGN

When you are planning
new plant you have in The Coniston Company
an amalgam of specialised knowledge in the fields of
Chemical, Mechanical and Electrical Engineering. Covering
every aspect from flow sheets to erection and operation,
the team of specialist engineers form an interlocked service
providing the most efficient manufacturing
unit—be it a single item or a complete plant.

CONISTON

THE CONISTON COMPANY

(CONTROLLED BY THE CONISTON ENGINEERING CO. LTD.)

EAGLE HOUSE HIGH STREET WIMBLEDON SW19 TELEPHONE WIMBLEDON 8521 (PBX)

TELEGRAMS CONISTON TOOT LONDON (INLAND) CONISTON LONDON (OVERSEAS)

P1961/G

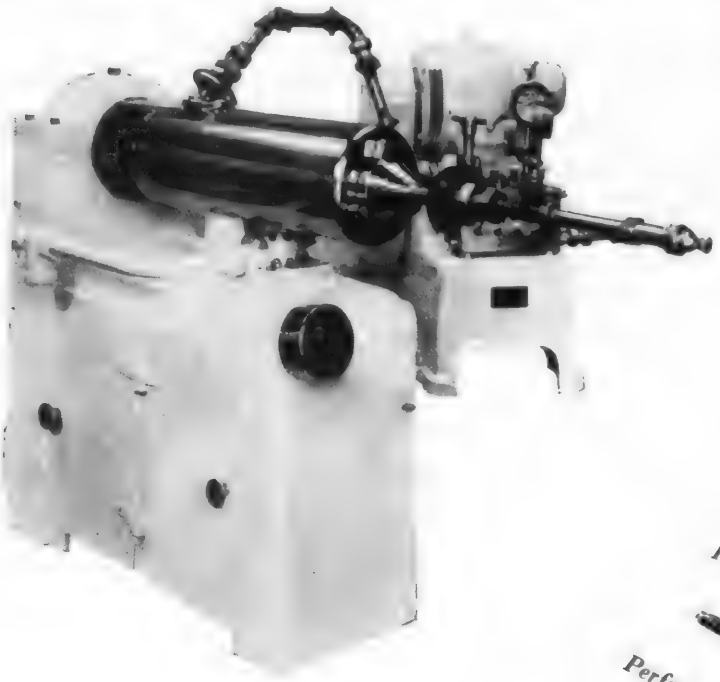
This is the answer to your processing problems

CLARKE-BUILT

CONTINUOUS ROTARY PROCESSING

FOR PASTES, CREAMS, SYRUPS, FATS, VISCOUS SOLUTIONS

GIVES YOU THESE BIG ADVANTAGES . . .



Continuous Rotary Heating, Cooling and Freezing

Simple yet Accurate Control of Temperature and Volume

Constant Output

Big savings in time, labour and floor space

Instant Speed Variation

Perfect Hygiene

Simpler and Speedier Packaging

Rapid and efficient Heat Exchange

If you are looking for Continuous Processing equipment that cuts your production costs *and* improves your product, call in

CLARKE-BUILT LIMITED

POWER ROAD, CHISWICK, LONDON, W.4. Telephone: CHISWICK 7631-4 & 6306-8

GREAT-GRANDFATHER SPEAKS HIS MIND

"Keep it under control, m'boy: but keep it simple..."

Great-Grandfather, and the industry of his day, had to do without frills—but they weren't always the worse for that.

PROCEEDING, GREAT-GRANDFATHER SAID:

Because the clever chaps are beginning to talk to you about automation, don't run away with the idea that *everything* in industry is going to be done that way at once.

With labour costs as they are and quality so important you *must* have automatic control for your heat-using process operation. But it sounds to me as if the Sarco simple, direct method of temperature control by hydraulic expansion has many applications on plant for simple, direct folk like us.

You don't need to pay from two to twenty times as much for a control if Sarco simplicity will do.

Better find out how far Sarco can go with your problems before you get too involved with the electronic boys."

SPIRAX-SARCO STEAM CONTROL

SPIRAX-SARCO LTD., CHELTENHAM, Glos. *Phone: Cheltenham 5175-76 Grams: Spirax, Cheltenham*
LONDON OFFICE: 28 Victoria Street, S.W.1. *Abbey* 6101-3832

REQUEST SLIP FOR FURTHER INFORMATION

To SPIRAX-SARCO LTD., CHELTENHAM, Glos.

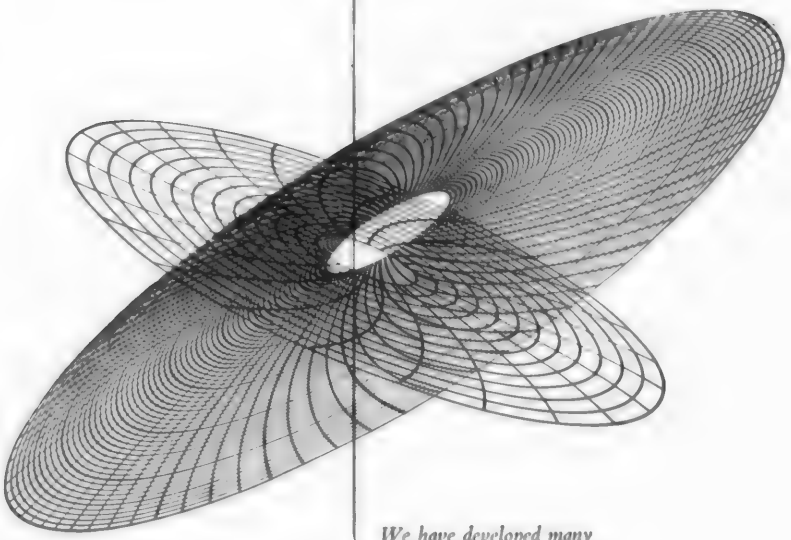
Please send details of Sarco Automatic Temperature Controls.

NAME:

ADDRESS:

FM1955

INSTRUMENTATION



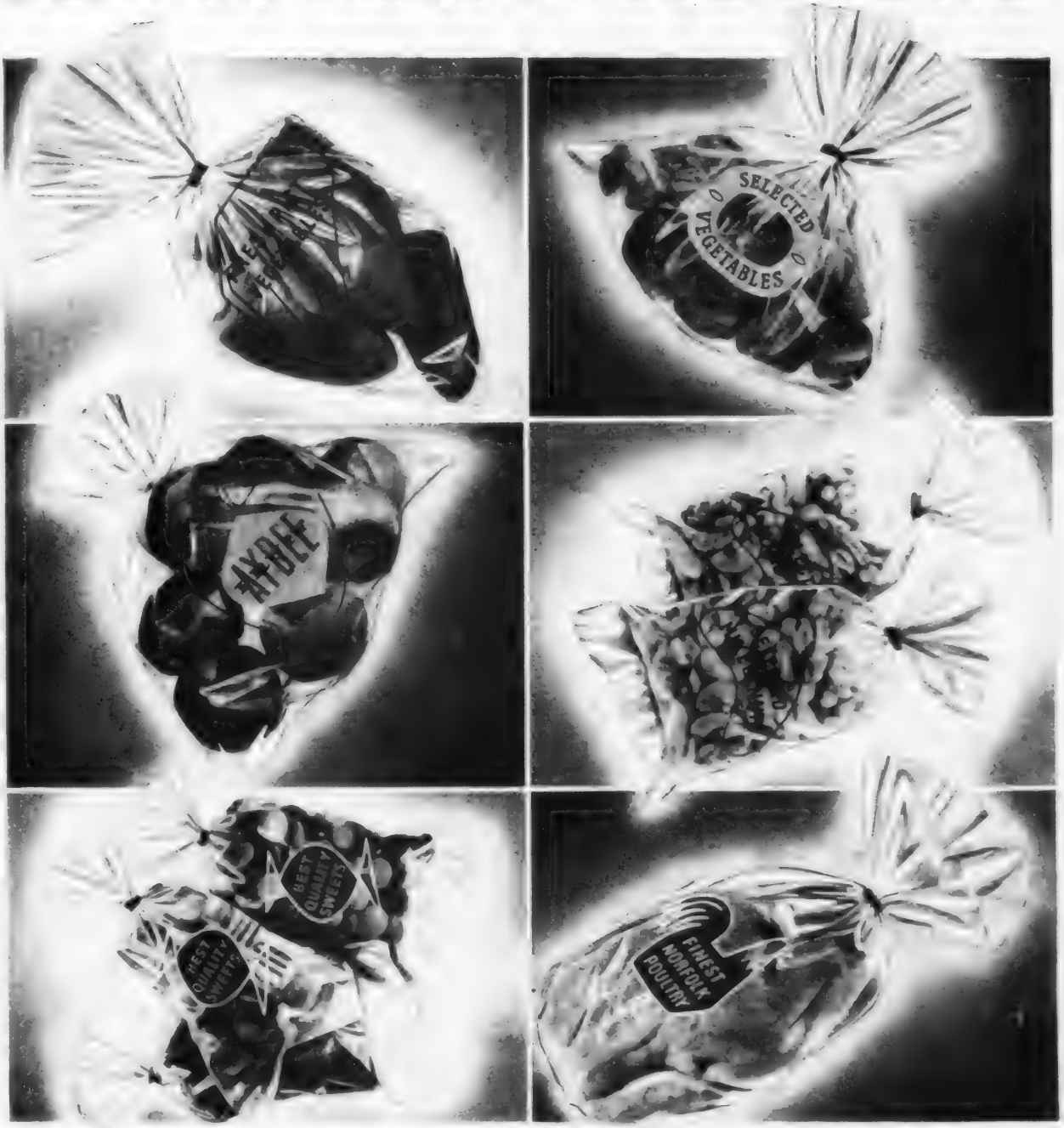
We have developed many improvements in the design of the Mercury-in-Steel Thermometer. Others have paid us the compliment of imitation — without however achieving our standard of performance. Specify Negretti & Zambra.

Contract, panels and installation service available.

NEGRETTI & ZAMBRA

NEGRETTI & ZAMBRA LTD., REGENT STREET, LONDON

SEEN and CLEAN in Diothene



Diothene is a new flexible film for packaging. It is transparent for sales appeal, tough for protection and perfectly hygienic. Diothene has no odour, is non-toxic and cannot taint any food product. Diothene cannot cause corrosion in contact with metals. Heat sealing forms a strong durable weld, giving it excellent handling properties.

MB DIOTHENE (POLYTHENE)

The tough transparent film that *ADDS SALES APPEAL!*

THE METAL BOX COMPANY LTD · *Flexible Packaging Division* · **THE LANGHAM · PORTLAND PLACE · LONDON W.1**

FP3326

"GOLDEN GLOW" Dried Milk Powders, Full Cream and Separated, are the ideal ingredient for a wide range of food manufacturers. Expert advice on your specialised requirements will gladly be sent free on request.

Write to DEPT. A6

D.M.P. SALES LTD., CENTRAL BUILDINGS, GUILDFORD

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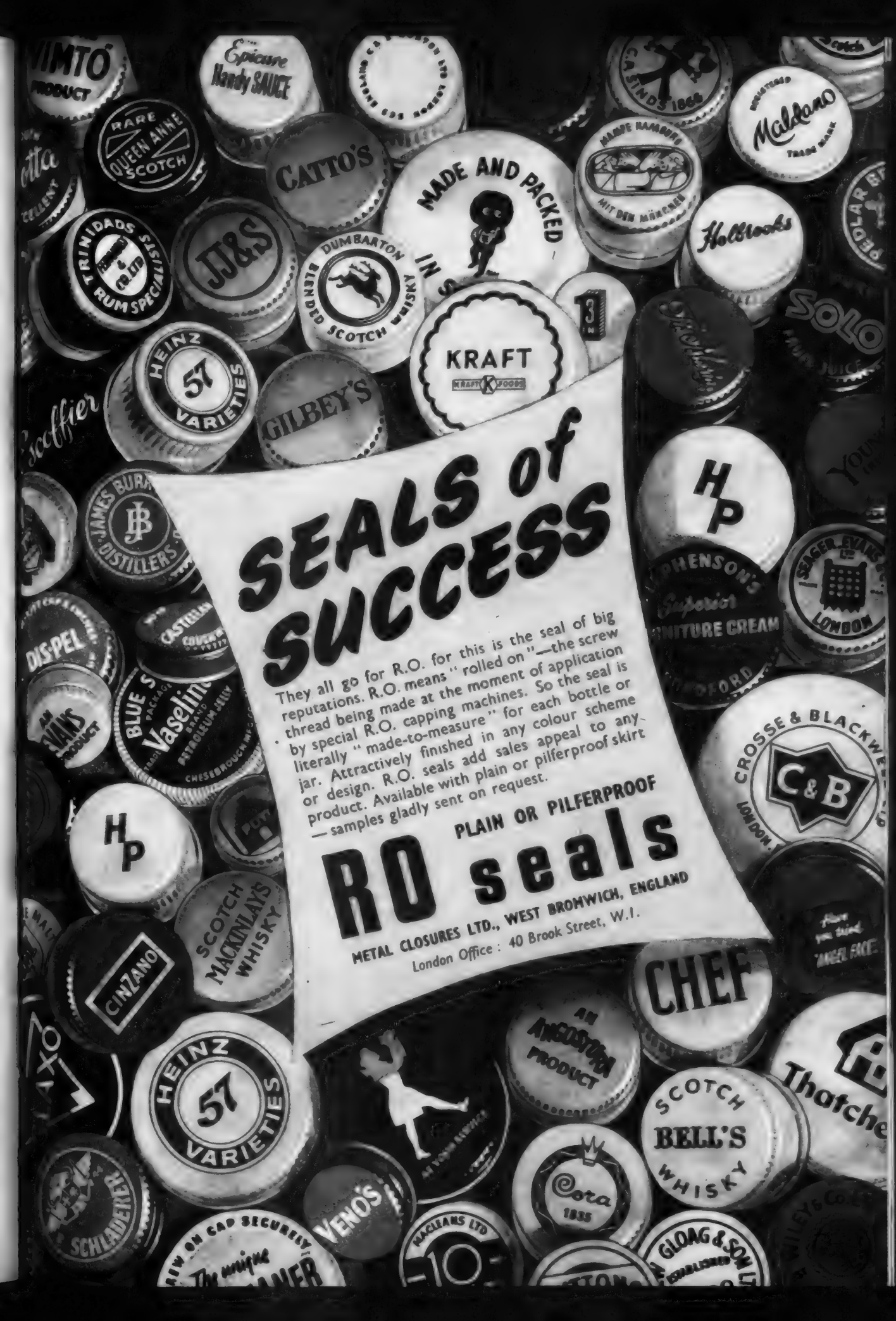
SEALS of SUCCESS
They all go for R.O. for this is the seal of big reputations. R.O. means "rolled on"—the screw thread being made at the moment of application by special R.O. capping machines. So the seal is literally "made-to-measure" for each bottle or jar. Attractively finished in any colour scheme or design. R.O. seals add sales appeal to any-product. Available with plain or pilferproof skirt —samples gladly sent on request.
PLAIN OR PILFERPROOF
RO seals
METAL CLOSURES LTD., WEST BROMWICH, ENGLAND
London Office: 40 Brook Street, W.1.
VIMTO
Epicure Kandy SAUCE
RARE QUEEN ANNE SCOTCH
CATTO'S
MADE AND PACKED IN
TRINIDAD'S RUM SPECIALISTS
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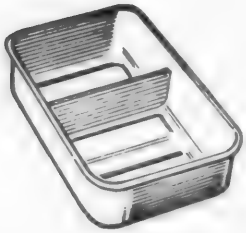
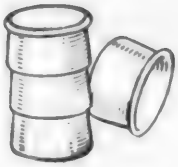
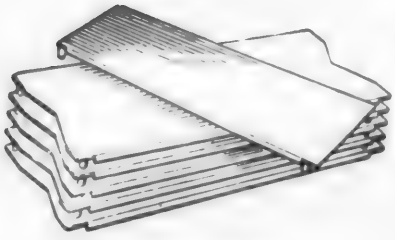
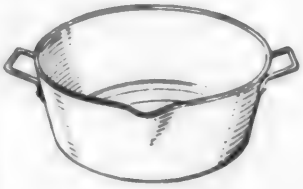
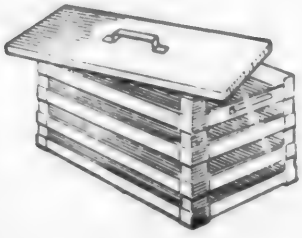



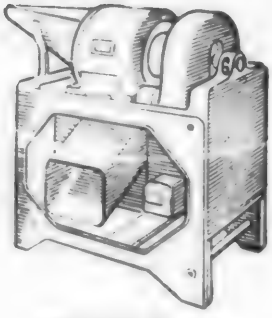




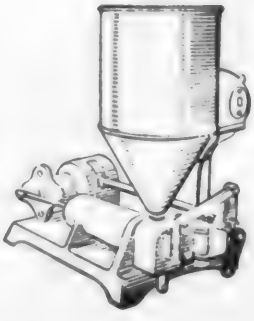
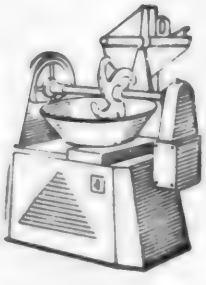
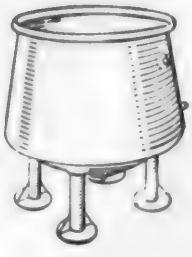
a little

LISSAPOL

(liquid cleanser)

goes a long way . . .



For further information please apply to :

IMPERIAL CHEMICAL INDUSTRIES LTD.,
LONDON, S.W.1

ICI

D849

-consistently good

VENESTA FOIL

VENESTA LIMITED *Packaging Division*, Vintry House, Queen Street Place, London, E.C.4. *CENtral 3040*

MALT EXTRACT

DRIED MALT EXTRACT POWDER

MALT FLOUR

An ever-increasing application to food industries

EDWARD FISON LIMITED

FACTORY CEDARS STOWMARKET SUFFOLK

Maltsters for more than a Century

THE CAP THAT'S EASY TO REMOVE...

...yet easy to put on and safe in transit

Metal Box *know-how* **does count!**

The new Garda Cap, a recent product of the Metal Box Company's Cap Group, has been ingeniously designed for the high speed hermetic sealing of jam and preserve jars. Made of light gauge aluminium with a tapered rim, the Garda Cap can be stacked conveniently for feeding into fully automatic closing machines—also supplied by Metal Box—and can be used with British standard jars. The method of application which embodies the process of vapour sealing ensures an efficient seal, yet because of its split skirt the Cap can be easily removed when pierced. The Metal Box Capping Service does more than provide a suitable cap for a special purpose. It assists the packer with expert guidance on the methods of sealing and it supplies and advises on the use of his sealing machines. Moreover, it enables him to gear his closing operations to the speed of his production and filling lines.

THE METAL BOX COMPANY LIMITED

Metal Containers · Paper Products · Flexible Packages · Plastic Laminates

THE LANGHAM · PORTLAND PLACE · LONDON W.1

APPLIED EXPERIENCE

WHEN British Cellophane Limited sells a roll of film — it may be "Cellophane" cellulose film, B.C.L. polythene or Courtaulds' cellulose acetate —the company is, nine times out of ten, indirectly involved in the sale of someone else's product as well. This is true of all packaging materials. It is especially true of those which face the final, searching test in the shops.

This is where the services of British Cellophane Limited come in. No producer of merchandise can employ a staff qualified in *all* aspects of the highly-specialised business of packaging. But he can do the next best thing—call upon the unrivalled knowledge and experience of the B.C.L. organisation's team of packaging specialists, scientists, engineers and designers.

British Cellophane Limited has behind it a wealth of packaging knowledge collected from its agents and associates in 47 countries. At home, the company is constantly adding to its considerable experience which embraces the packaging of every type of consumer product — from fresh meat to household textiles.

This unique organisation exists for a single purpose — to help the user of packaging films to get the best possible results from them.

With its ready assistance and advice, British Cellophane Limited is making a positive contribution to better packaging. And today, more than ever before, good packaging means good business.

AND NOW . . . COLODENSE

COLODENSE LIMITED, leading converters and high-quality printers of transparent cellulose film, are now a wholly-owned associate of British Cellophane Limited. More power to the B.C.L. film-user! Whether he needs "Cellophane" in rolls, in sheets, in bags, unprinted or printed in one colour . . . or printed in five colours . . . for wet or dry products . . . for frozen foods or fabrics . . . the B.C.L. organisation can supply it.

"CELLOPHANE" — the first packaging film — and the greatest!

BRITISH CELLOPHANE LIMITED

Commercial Offices: 12/13, CONDUIT STREET, LONDON W.1

Reg. Offices and Factory: BATH ROAD, BRIDGWATER, SOMERSET

"Cellophane" is the registered trade mark of British Cellophane Limited and denotes the brand of cellulose film manufactured by them

JUST WHAT THE 'CHIEF' WANTS!

WARWICK

introduce the Containers

C.N. 24159

that

STACK (WITH LIDS) WHEN FULL and NEST WHEN EMPTY

- Seamless 14g Aluminium Bodies—pressed in One-Piece for Absolute Hygiene.
- Eminently suitable for Transport and Storage of all kinds of foodstuffs.
- Internal Top dimensions 23½" x 14½". Effective depth 8". Saves two-thirds Storage Space.
- Aluminium lids.
- **Weight only 8 lbs. Nest to 2½ inches.**

WARWICK for HYGIENIC ALUMINIUM EQUIPMENT

"JUST THE THING!"

WARWICK PRODUCTION COMPANY LTD

IN ASSOCIATION WITH **ALMIN LIMITED** STOKE POGES · BUCKS

BIRMINGHAM ROAD · WARWICK · Telephone WARWICK 693-696

Where **TEMPERATURE CONTROL** is all-important

The fermentation room in the bakery of Bolands Limited, Grand Canal Quay, Dublin

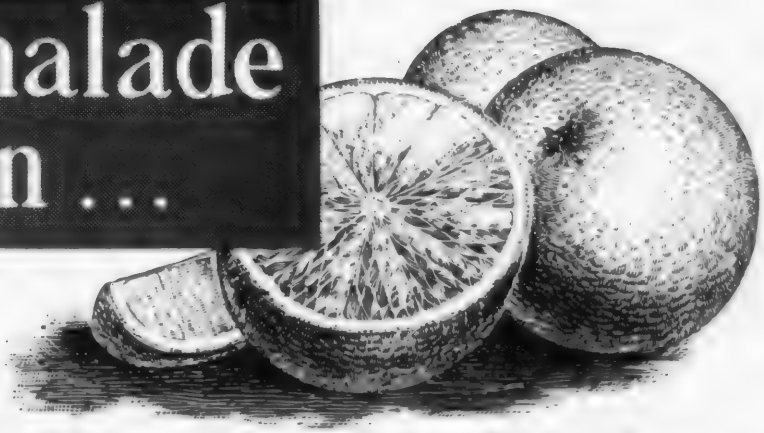
THE TEMPERATURE in this room must be maintained at 80 degrees Fahrenheit. That is one reason why it has walls of "Insulight" Hollow Glass Blocks. But not only do they give the necessary degree of thermal insulation—they fill the room with natural light and, because they are so easily kept clean, they are a valuable aid to hygiene. For efficient temperature control in well-lit, hygienic surroundings specify "Insulight" Hollow Glass Blocks.

"INSULIGHT" HOLLOW GLASS BLOCKS

PILKINGTON BROTHERS LIMITED

For further information on the use of glass in building consult the TECHNICAL SALES AND SERVICE DEPT., ST. HELENS, LANCS. (TEL: ST. HELENS 4001) *or* SELWYN HOUSE, CLEVELAND ROW, ST. JAMES'S, LONDON, S.W.1 (TEL: WHITEHALL 5672-6). *Supplies are available through the usual trade channels.* 'INSULIGHT' *is a registered trade mark of Pilkington Brothers Ltd.* H.G.8.21

Marmalade season . . .



Offset probable raw material rises by installing the Kellie automatic

"4 in ONE"

CUTS LABOUR COSTS BY 90%

Oranges, Lemons, Tangerines, Grape Fruits, etc., from 1⅛" to 3½" diameter cut automatically into quarters, irrespective of shape. No Grading required.

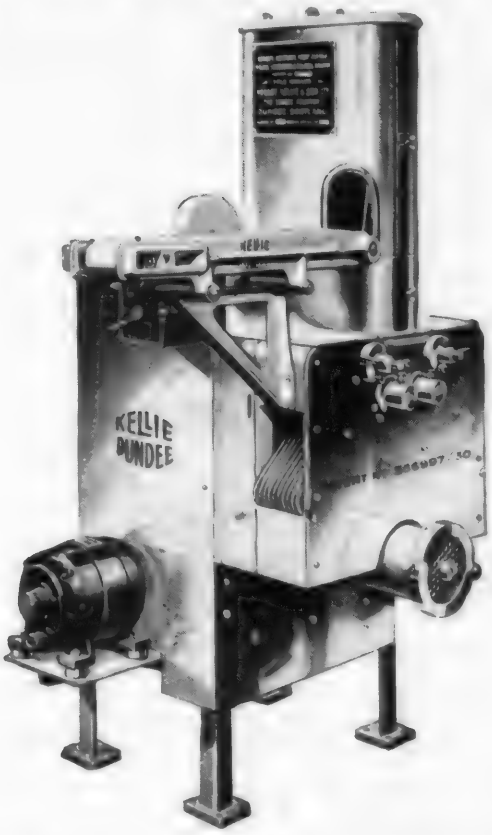
The fruit is automatically pulped, and the peel is separated to any required thickness from $\frac{3}{32}$" to ½", ready for shredding.

Thickness of peel instantly adjustable, micrometer accuracy being guaranteed; an absolutely clean peel, or one with a small proportion of pulp is obtainable at will.

Peel, fruit pulp and juice are delivered separately at 12 lbs. per minute. The labour costs for this output SHOW A REDUCTION OF OVER 90% over handwork. This alone would enable the cost of the machine to be recovered in a few weeks.

The risk of skin disease to workers is absolutely eliminated with this machine.

Arranged for direct coupled electric motor or belt drive with fast and loose pulleys.



This Kellie

1 QUARTERS
2 PEELS
3 SEPARATES
4 PULPS

ROBERT KELLIE & SON, LIMITED, DUNDEE, SCOTLAND

A Guide to the English Character . .

Resistance to Climate . . .

No doubt it is the Englishman's predilection for cross-ventilation (called 'draughts' by foreigners) that renders him, and her, so resistant to the aquatic life of the native summer. It may be his belief in the virtues of the Arctic blast as an adjunct to health that lends to his cough the virile resonant note of the true open-air man. Engineers, though, are usually more concerned with corrosive attacks than coughing attacks. Fortunately, their remedy is close to hand; they rely upon Semtex. Though the value of Semtex cements as a cough-cure remains to be proved, their efficacy in corrosion-resistance work is undoubted. Works Managers who wish to keep their industrial plant in the pink of physical condition should write to one of the addresses below for the advice and illustrated brochure of the Semtex Industrial Division.

SEMTEX

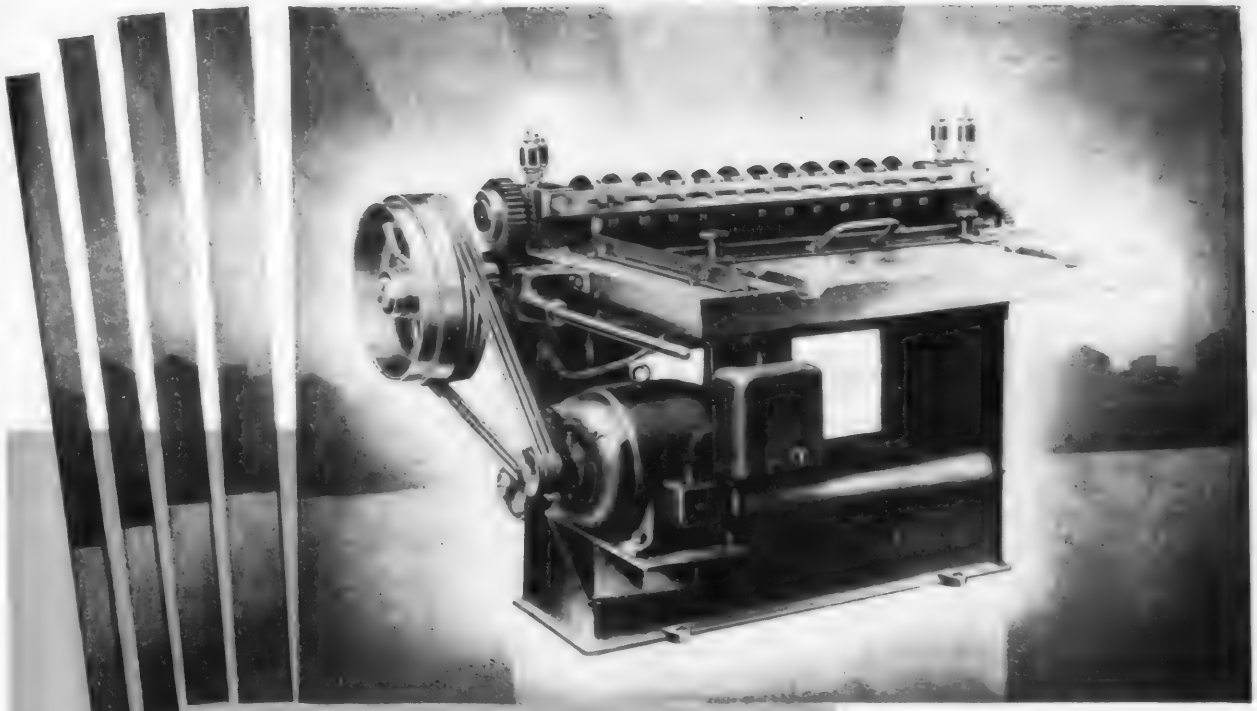
INDUSTRIAL DIVISION

Headquarters and Southern Area Office:
Semtex House, The Broadway, Welsh Harp, London, NW9 Tel: Hendon 6543

Northern Area Office: **50 Blackfriars Road, Salford, 3 Tel: Deansgate 2128**

SPECIALISTS in INDUSTRIAL ANTI-CORROSION TREATMENTS · FLOORING & DECKING CONTRACTORS

A Dunlop Company



BLISS Gang Slitters

Built to slit straight, fast and true . . .

and stay that way for years

Whether you want to prepare blanks for can body-makers, cut strips for Strip Feed Presses, or trim sheets for litho machines, you can't buy better than Bliss.

These rotary-type machines are engineered to yield consistent, accurate slitter output. Solid one-piece bearings, heavy frames and end thrust bearings combine to give the accuracy you need—and give *it* hour in and hour out over years of steady production.

Cutters may be set to shear on either edge and furnished with adjustable hubs, in standard or narrow widths. A grinding attachment which sharpens the cutters in position is available as are a variety of special gauges.

If you want accurate, dependable slitter production, the Bliss Gang Slitters are worth investigating.

E. W. BLISS (ENGLAND) LTD.

CITY ROAD · DERBY

Telephone: DERBY 45801

London Office:

2/3, THE SANCTUARY, WESTMINSTER, S.W.1

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B/23

BLISS on your machine is more than a name . . . *it's a guarantee!*

BLISS CAN AND CONTAINER MAKING MACHINERY

SLITTERS · BODYMAKERS · FLANGERS · SEAMERS · SCROLL SHEARS · STRIP FEED PRESSES

Less handling More space...

when you install JENNER

More labour—and floor space—for the asking! *Both* are certainly possible. But if you think you can't afford them, just consider: What percentage of your present labour force is engaged in carrying, loading and shifting? How many valuable square yards are mere corridors for themselves and their trolleys?

The installation of a Jenner Conveyor would release practically the whole of this manpower. It would, in addition, make other space available—space that you *cannot* at present use because of struts, pillars and other structural obstacles.

Invite a Jenner representative to your works and you'll be making the first step towards increased productivity!

A. & C. JENNER CONVEYORS LTD.

CLARENDON WORKS · MITCHAM · SURREY · *Phone:* MITcham 4044 5

In use all over the world by large and small users

C.P. are specialists in high standard finish Stainless Steel, continuous and batch processing patented equipment (controlled heating, cooling, mixing and aeration), for most kinds of food products.

MULTI-PASS PLATE EXCHANGERS
CAPACITIES H.T.S.T. Pasteurising 100-2,500 IMPERIAL G.P.H. and corresponding increases for heating and cooling duties.

Incorporating the patented detachable seals (non-toxic) with flat stainless steel heat exchange plates. It is the most advanced development in heat exchange design ensuring a most efficient heat exchange at low pressures, enabling hygienic cleaning to be carried out more easily than on any other plate heat exchanger. The frames are stainless or mild steel construction.

MULTI-PROCESS STAINLESS STEEL VATS
Capacities 50-500 IMPERIAL G.P.H.

The perfected hygienic vat for mixing, heating, cooling or pasteurising liquid food products. Special thermostat control and scientific insulation enables temperatures to be maintained over long periods accurately and economically.

FAT CHILLING AND PLASTICISING MACHINES
OUTPUT CAPACITIES VARY ACCORDING TO THE FATS AND TEMPERATURE RANGE

Three sizes of machines available producing 15 cwt.-35 cwt. per hour. For chilling, blending and intensive mixing of fats this machine offers continuous production in place of batches. No mess, no handling, perfect hygiene. Accurate control giving a fine and constant texture—in short all advantages which will improve the product and greatly lower production costs.

MARSHMALLOW AND FILLING PROCESSORS
APPROX. CAPACITIES FROM 450 lbs.-1,500 lbs. PER HOUR

Ideally suitable for heat exchange and mixing duties of viscous materials, excellent for cooling and blending caramel and similar fillings for the confectionery industry.

MULTO-FLO HOMOGENISERS CAPACITIES 100-1,500 IMPERIAL G.P.H.

This outstanding modern unit ensures uniform dispersion of the molecules of solid throughout the solution. Economic in operation and easy to clean. The expendable patented C.P. Single Service Valve made of single stainless steel wire compressed into a cone, with the three-cylinder pump and stainless steel frame, ensures efficient dispersion at low working pressures with minimum of maintenance and operating costs.

LABROE SOFT ICE MACHINES
PRODUCING UP TO 1,340 lbs. PER HOUR ICE

Provides a continual supply of chilled water at 32 F. even at peak loads.

DUPLEX CIRCULAR STAINLESS STEEL PLATE FILTERS

A first-class filter with outputs from 2,000-20,000 lbs. per hour depending on product range and application.

ROTO-SEAL F.M.B. STAINLESS STEEL CENTRIFUGAL PUMPS

Capacities of these universally used 1½ in. bore pumps are up to 2,400 Imperial G.P.H. at 24 ft. head. The perfect pump at the right price.

IN-THE-LINE FILTERS (3 in. and 6 in. diameter)
RANGE OF CAPACITIES UP TO 5,000 lbs. ACCORDING TO APPLICATION

Other equipment supplied specifically for the food and allied trades include stainless steel concentrate tanks, storage tanks and all types of pressure vessels, positive displacement pumps, sanitary piping and fittings, sundry equipment and utensils, etc.

Fully illustrated Leaflets showing applications of equipment sent on request, write now to

THE CREAMERY PACKAGE MFG. COMPANY LTD.
MILL GREEN ROAD · MITCHAM JUNCTION · SURREY
Telephone: Mitcham 2981 (3 lines) Telegrams: Seepyko, Mitcham

With Apologies to a Famous man

All your parcels may arrive Safely some of the time —

— And some of your parcels may arrive Safely all the time —

– But all your parcels won't arrive Safely all the time —

– unless of course you seal them every time with –

GUMSTRIP (Regd.) SEALING TAPES & MACHINES ● TACKY LABELS

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SELF-ADHESIVE SEALING TAPES ● WATERPROOF WRAPPINGS

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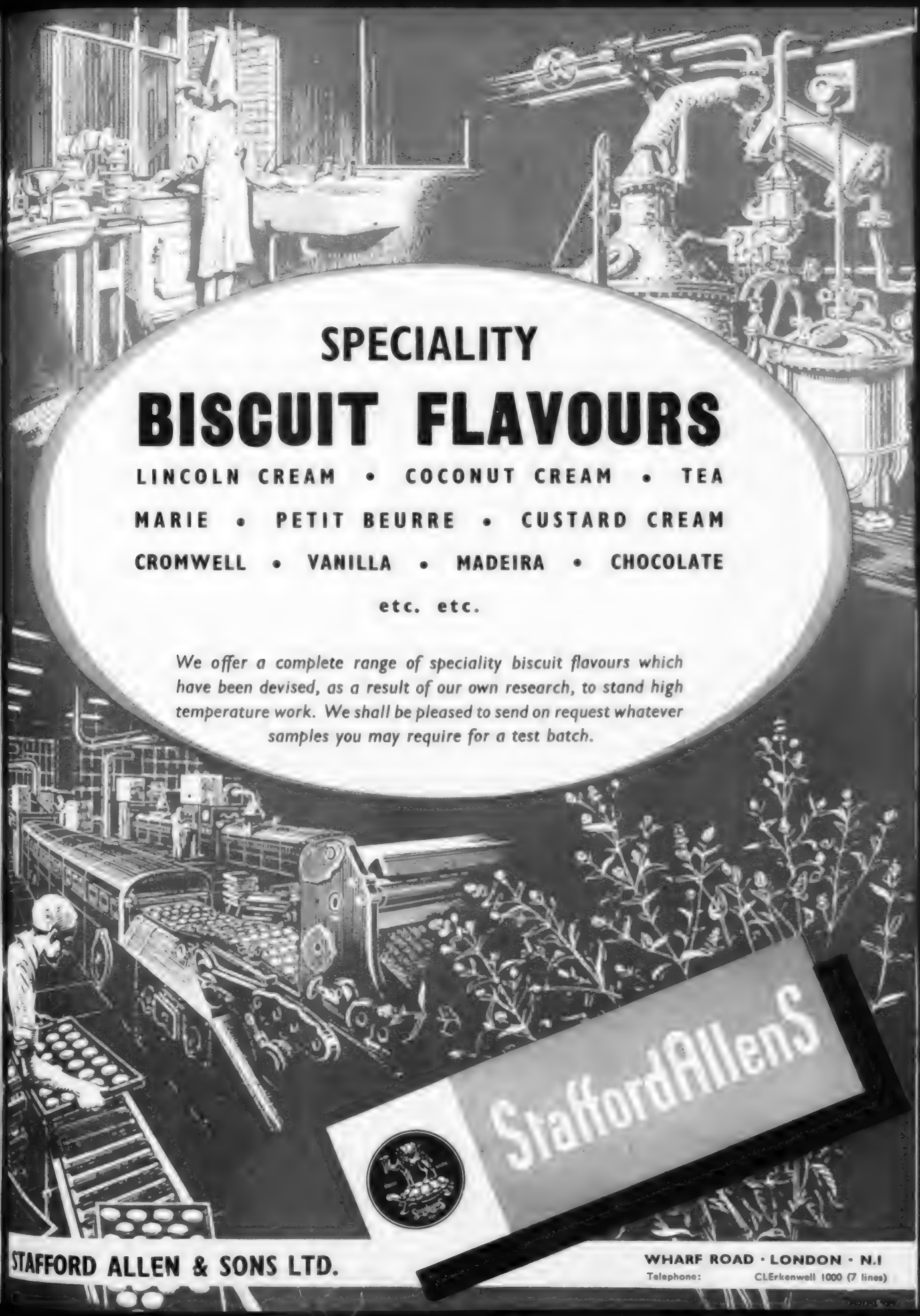
SEALING MATERIALS
AND
SEALING MACHINES

SAMUEL JONES & CO. LTD

NEW BRIDGE ST.
LONDON, E.C.4.
CENTRAL 6500


SPECIALITY
BISCUIT FLAVOURS
LINCOLN CREAM • COCONUT CREAM • TEA
MARIE • PETIT BEURRE • CUSTARD CREAM
CROMWELL • VANILLA • MADEIRA • CHOCOLATE
etc. etc.
We offer a complete range of speciality biscuit flavours which have been devised, as a result of our own research, to stand high temperature work. We shall be pleased to send on request whatever samples you may require for a test batch.
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STAFFORD ALLEN & SONS LTD.
WHARF ROAD · LONDON · N.1
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On reflection - you'll choose PHŒNIX

HESTON EQUIPMENT CO. LTD.

ALUMINIUM EQUIPMENT

FOR HYGIENE AND THOROUGH 'CLEANABILITY'

FOR LIGHTNESS COMBINED WITH ROBUST RIGIDITY

FOR DURABILITY AND CONSEQUENT ECONOMY IN REPLACEMENT

FOR PRECISION INTERSTACKING

FOR EASE OF FAST HANDLING AND PALLET-MOVEMENT

Enquiries, stating requirements are invited to the address below, where Phœnix equipment can be inspected in spacious showrooms.

Write to Dept. F.M.

HESTON EQUIPMENT

HESTON EQUIPMENT

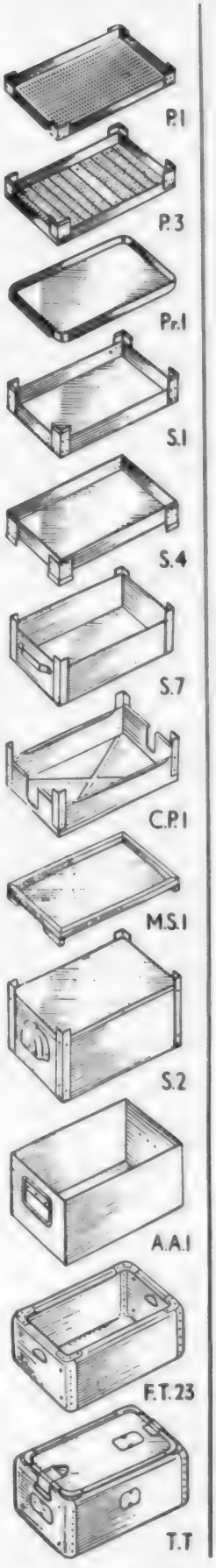
1, BUCKINGHAM PALACE MANSIONS

A Member of the

- for HYGIENE and ECONOMY

Phœnix Trays and containers are manufactured for users' requirements either by adaptation of standard types to special dimensions, or by special design for the purpose. All are precision manufactured from high-grade aluminium.

Phœnix interstacking trays fulfil the inflexible requirement of hygienic processing and all-round efficiency demanded by such leading manufacturers as Messrs. John Mackintosh & Sons Ltd.; Needlers Ltd.; C. Shippam Ltd.; Edward Sharp & Sons Ltd., etc.



KEY: Reduced illustrations in the right hand column show a selection of types selected from the Phoenix range of interstacking aluminium industrial equipment, including S.1; S.4; shallow working, sorting and storage trays. S.3; S.7; deep container trays with handles. M.S.1 Mogul starch tray. C.P.1 Chocolate Plaque tray. Pr.1 Seamless pressed tray. P.1; P.2; P.3; P.4; Perforated Cooling trays. S.2 Storage Box with lid. S.8 Lidded tray and/or storage box. A.A.1 Watertight argon-arc welded container with handles.

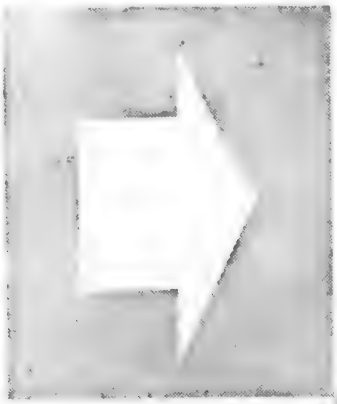
COMPANY LIMITED

LONDON, S.W.1. *Telephone: SLOane 9934-5-6*

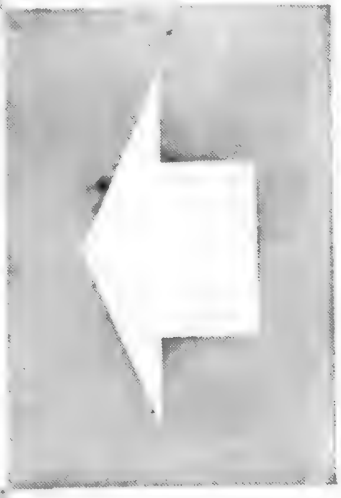
Heston Group of Companies

I.C.I. DENDRITIC SALT

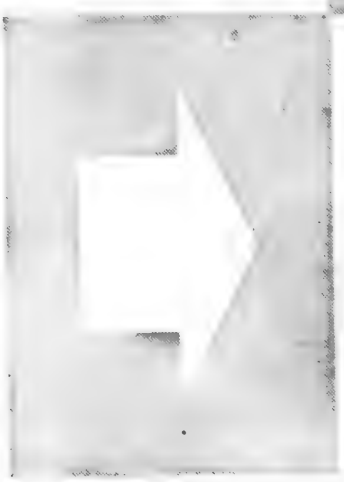
—*a NEW fine grade for foodstuffs*



I.C.I. Dendritic Salt is a fine vacuum salt with a new crystal shape. It is soft and floury, with the following distinctive qualities—which are of special advantage in many applications in the food and dairy industries :

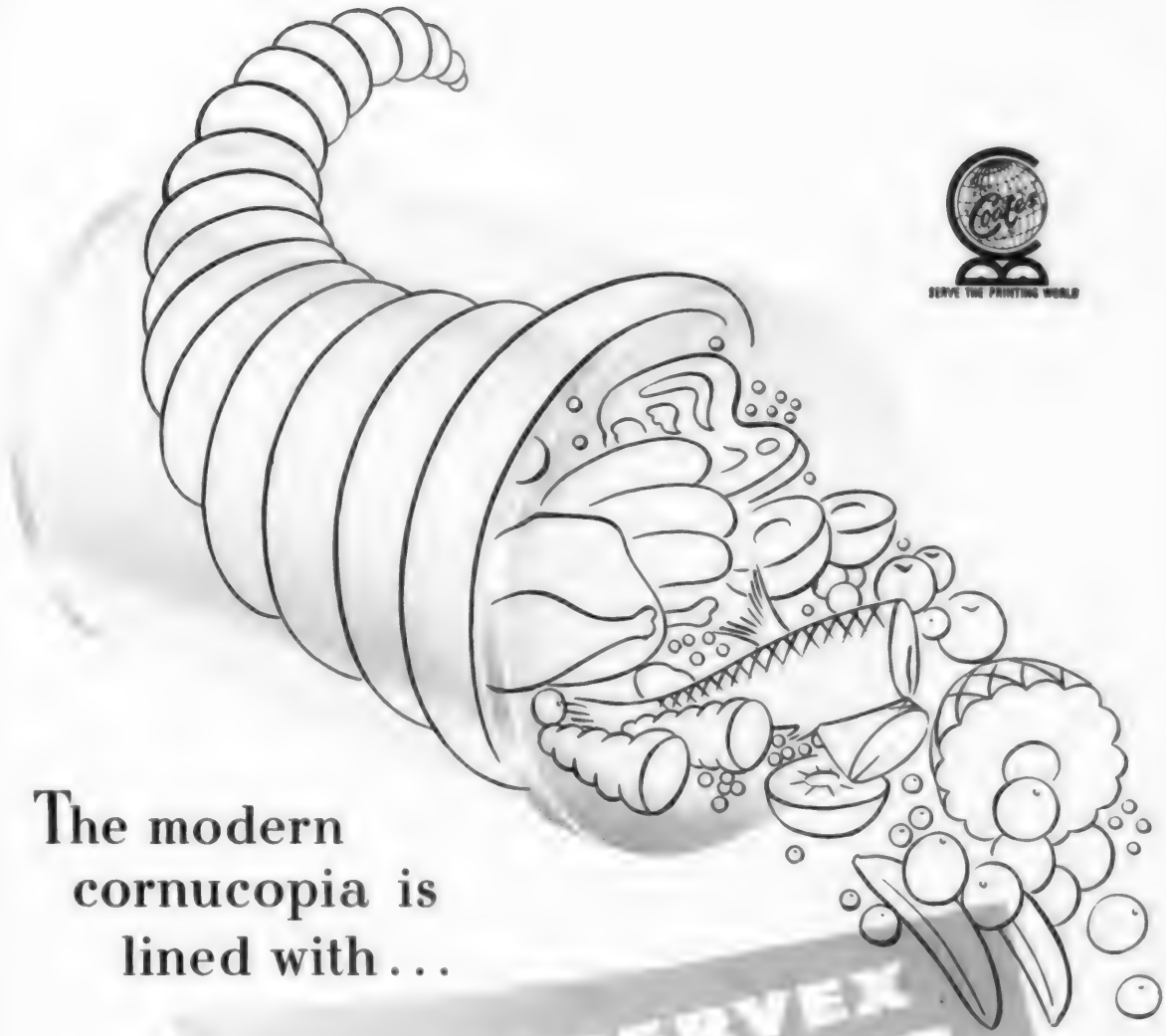


- Outstanding non-caking properties
- High purity—99.6% sodium chloride
- Blends well with other finely-divided materials
- Low bulk density—ensuring good covering power
- Rapidly soluble in water



I.C.I. Dendritic Salt is of particular interest to users of Dairy or fine Crystal salt, since it not only offers technical advantages but is also cheaper.
Imperial Chemical Industries Ltd. are the sole manufacturers of Dendritic Salt, which is protected by patents in Great Britain and other countries throughout the world.

IMPERIAL CHEMICAL INDUSTRIES LTD.
LONDON, S.W.1



The modern cornucopia is lined with . . .

Coates PRESERVEX M.U. LACQUER

The most satisfactory universal canning lacquer on the market. Preservex M.U. Lacquer gives maximum protection to all kinds of food under the most severe retorting conditions. It adds a decorative finish which attractively sets off the contents. Full stoving details will be sent on request.

COATES BROTHERS INKS LIMITED

EASTON STREET, ROSEBERY AVENUE, LONDON, W C.I.

Telephone: TERminus 2810 Telegrams: Inkstone, Kincross, London

We can supply air filters for the Food Industry to fit into every type and size of scheme. Our range is the most comprehensive available from one single manufacturer — and each filter is the leader in its particular field.

Below are brief details of our filter range. Why not write to-day for fuller information?

One cubic foot..

..or a million

AAF

Exclusive Manufacturing Licensee
AMERICAN AIR FILTER CO. INC.

ACI

Air Control Installations Ltd

RUISLIP · MIDDLESEX · Ruislip 4066 (8 lines)

BIRMINGHAM · MANCHESTER · NEWCASTLE-ON-TYNE · GLASGOW

PL-24

A dry filter employing an inexpensive throw-away medium. Compact; easy to maintain.

ELECTRO-PL

A dry type electronic precipitator of similar constructional design to the PL-24.

MULTI-DUTY

A positive self-cleaning viscous impingement filter with very high efficiency.

AIRMAT

A pocket type industrial filter employing various types of filtering media to suit conditions.

DUSTRAP

A complete range of throw-away and cleanable filters in standard size frames employing glass wool, wire wool and synthetic fibres as filtering media.

LFO

A viscous impingement type filter for manual cleaning.

CYCOIL

A compact filter combining centrifugal separation and viscous impingement, specially developed for compressed air and large diesel engines.

PERMUTIT
provides Demineralised Water
for Food Manufacture
For critical needs in food preparation, distilled quality water is essential, but distilled water is expensive: its production uses heat or steam.
The modern substitute is demineralised water, produced at only a small fraction of the cost of distillation by "Deminrolit" Ion Exchange.
"Deminrolit" plants are made in all sizes from Portable units to larger fixed installations, similar to the one shown here. If you would like to have them, we will gladly send full technical details.
The PERMUTIT Company Ltd., Dept. W.L.210, Permutit House, Gunnersbury Avenue, London, W.4. CHiswick 6431

The COMMER 1¼ ton

FORWARD CONTROL ALL-STEEL VAN

Smart and functional!

- 50 B.H.P. ENGINE WITH LONG LIFE POROUS CHROME BORES
- FOUR-SPEED SYNCHROMESH GEARBOX
- TELESCOPIC HYDRAULIC DAMPERS FRONT AND REAR
- FLUSH FITTING SLIDING DOORS
- ALL-STEEL CONSTRUCTION OVER 300 CU. FT. CAPACITY

Here is a sturdy all-steel van with success written all over it—your success! With its smart appearance and businesslike finish it will carry your prestige proudly through the streets, whilst its sound practical design will give remarkably long life and low operating cost.

Send for a brochure TO-DAY.

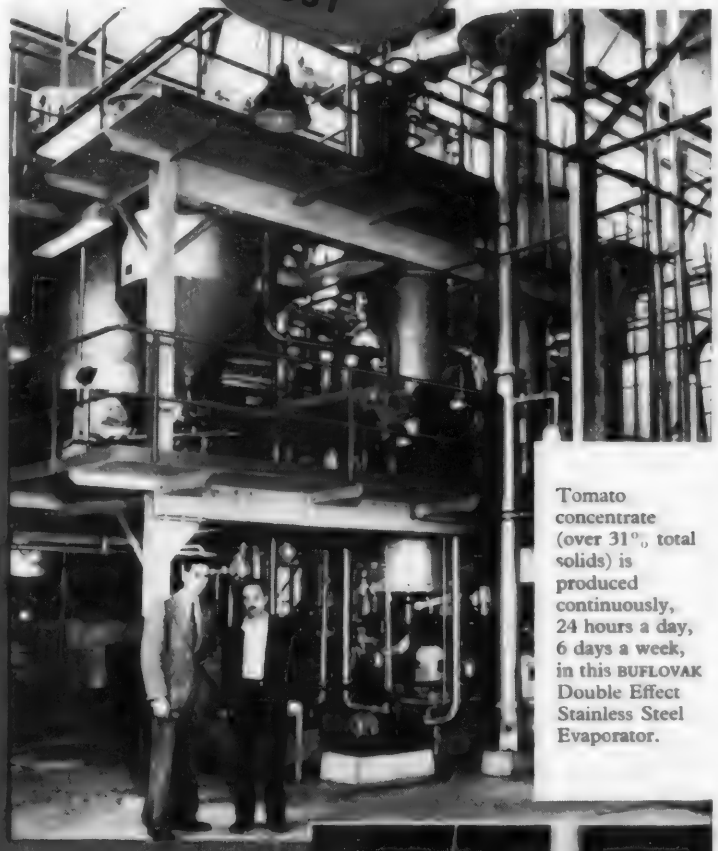
COMMER

A PRODUCT OF THE ROOTES GROUP

COMMER CARS LTD. LUTON BEDS. EXPORT DIVISION ROOTES LTD. DEVONSHIRE HOUSE PICCADILLY LONDON W.1

the 'fruits' of **BUFLOVAK** high grade concentration

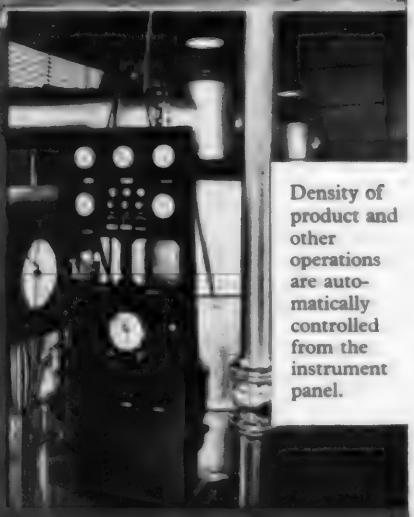
Is your business with the concentration of tomato pulp, or, for that matter, any other fruit or vegetable. Do you need a smoother, more uniform concentrate retaining all the natural flavour—at lower cost? If so, these and other problems of concentration can be settled successfully with Blaw Knox BUFLOVAK Evaporators, the most up-to-date range of processing equipment of this type. Orange pulp, for instance, can be processed to keep not only the true flavour but the vital vitamin content. There are types and capacities to suit most food processing requirements, all of which are easy—and economical—to operate. Ask us to discuss the details with you!



Tomato concentrate (over 31% total solids) is produced continuously, 24 hours a day, 6 days a week, in this BUFLOVAK Double Effect Stainless Steel Evaporator.

LET'S TALK IT OVER...

Why not telephone Blaw Knox? They will advise on all evaporation problems and on the most modern processing equipment for foods, chemicals and the plastics industry, including Flakers, Dryers (atmospheric and vacuum), Kettles, Autoclaves, Condensers, etc. —without obligation on your part!



Density of product and other operations are automatically controlled from the instrument panel.

BUFLOVAK

DOUBLE EFFECT EVAPORATORS

including LONG TUBE VERTICAL RAPID CONCENTRATION
FORCED CIRCULATION · LOW TEMPERATURE
DOWN FLOW & THERMO RECOMPRESSION types

BLAW KNOX

BLAW KNOX LTD., (BOX 112) 90/94 BROMPTON RD., LONDON, S.W.3

TEL: KENSINGTON 5151 · GRAMS: BLAWNOX, SOUTHKENS, LONDON · CABLES: BLAWNOX, LONDON

A good mixture —at a good saving!

Following a well-proved principle of Mixing and Beating, DURATAX Cake Mixers are unsurpassed for reliability. Well designed and of great constructional strength, each machine is GUARANTEED for 3 YEARS against faulty material and workmanship.

The DURATAX complete with Cake Beater, Wire Whisk and Dough Hook costs considerably less than other makes. Compare our prices.

Additional attachments may be operated.

10 Quart	-	£77 · 0·0
15 Quart	-	£99 · 0·0
20 Quart	-	£140 · 0·0
30 Quart	-	£182 · 0·0
60 Quart	-	£259 · 0·0
80 Quart	-	£342 · 0·0

You invest when you buy DURATAX

"Duratax" Electric CAKE MIXERS

LEADING IN QUALITY—DURABILITY—SERVICE

CHEAPEST TO PURCHASE AND MAINTAIN.

★ *SEND FOR ILLUSTRATED LEAFLET*

The Proud Products of

JOHN HUNT (BOLTON) LTD.

ALMA WORKS · RASBOTTOM STREET · BOLTON · ENGLAND

Telephone: BOLTON 5831-2 **Telegrams: HUNT 5831 BOLTON**

'Clarifoil'

TRADE MARK

TRANSPARENT ACETATE FILM

Sells on sight!

- 'Clarifoil' is a tough, crystal clear acetate film.
- Brilliant sales appeal.
- Does not wrinkle.
- Can be laminated.
- Printable in multi-colours.

Walls Pie Carton, Gleasons Currants Pack made by E. S. & A. Robinson.
Lyons Tartlet Carton made by the Metal Box Company.
Nescafe Sachet made by Brown, Bibby and Gregory, branch of the Metal Box Company.

BRITISH CELANESE LIMITED

Plastics Division, Celanese House, Hanover Square, London, W.1 Mayfair 8000

BOWATERS

Development is in the air at Bowaters. New projects—part of the recently announced plans for the future expansion of the Organisation—will increase the output of packaging materials, particularly multiwall sacks and corrugated fibreboard containers. The Organisation's research facilities will also be strengthened. These new resources will be harnessed to the task of giving even better service to a widening circle of Bowater customers.

Opening Score

Another Bowater 'first'. Anticipating the demand for a cheaper tear-open corrugated case, Bowaters have developed the production of cases employing a new easy-opening device.

Instead of using a tear-tape, the new method consists simply of two parallel slits running all round the inner liner. The cases are as easily—and as quickly—ripped open as the tear-tape type but, naturally, production costs are lower. *The upcharge on Bowaters slit-liner cases is only one-third of that carried by cases employing a tear-tape.*

This Bowater development brings the advantages of easy-opening cases within the reach of an even wider range of manufacturers. The advantages? Quicker unpacking for the retailer and so more goods on display; no goods rendered unsaleable through careless slitting of the outer package.

Other advantages are less direct but nonetheless powerful. Tear-open cases are new—brand new. The manufacturer who adopts them immediately gains a marketing plus which can lead to increased dealer enthusiasm and greater sales.

If you would like to know more, Bowaters will be glad to hear from you.

Good for Sales

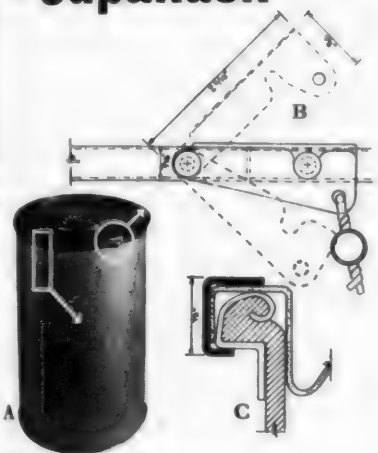
One after the other they go into the shopping basket—bread, frozen fish, sweets, biscuits. And when the housewife gets them home they taste exactly as they should. Individual flavours and odours have been unaffected by their journey home together.

How is that possible? Each of these products is wrapped in waxed paper. Bowaters turn out miles of it every week. Waxed wrappers provide a low-cost answer to the problem of how to preserve the freshness and flavour of mass-produced food items.

Bowater waxed wrappers not only keep the product in good condition, they make it look good and *feel* good. The shining waxed surface displays colour printing beautifully—important when so much shopping is done on sight and on impulse.

PACKAGING BULLETIN

Fibre + Steel = Supakask



A—The Supakask
B—Detail of pilfer-proof clip.
C—Section across wall of drum showing lid held securely in position by locking band.

There are many points of interest about the Supakask—Bowaters' new fibre and steel drum. Take that full open top, for example. It means speed and ease in filling and emptying.

The steel lid makes a snug fit with the drum. Add the locking band, with its pilfer-proof clip, and the closure between lid and drum is sound, sealed and secure. If the nature of the goods or conditions of transport or storage demand it, a rubber gasket can be introduced.

The popularity of the Supakask, and lightweight fibre drums generally, continues to grow and polythene liners are being increasingly used to widen the range of the commodities they can carry. The Supakask is wound without stitching so that the inside is absolutely smooth and there is no risk of snagging or tearing any liner.

Note: Full open top—smooth inside wall

Glassine—that remarkable member of the greaseproof family—protects many of the food industry's products while enhancing their quality feel and sales appeal. Glassine bags can be cut to fit a variety of other products, too, including medical supplies and small engineering parts.

So many food products, high in grease content or easily spoiled by moisture vapour, get that extra protection from laminated glassine. Food and cake mixes, particularly, demand unusual care in their packaging. Their ingredients vary in grease and moisture content but it is absolutely vital that their individual properties should be retained to preserve the quality and balance of the mix.

Many wise manufacturers use Bowaters' laminated glassine bags as carton liners. Maybe you could, too?

WHY PAY MORE . . .

. . . for protection that your product does not need?

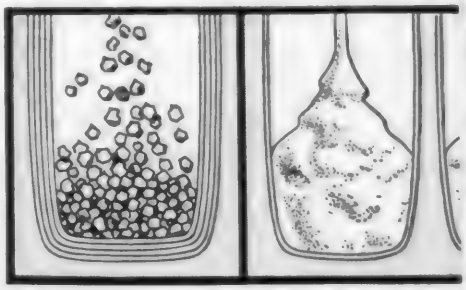
The construction of Bowaters' multiwall sacks is such that you can have exactly the amount of protection your product needs, according to its nature and the risks it runs in transit. Both the number and the type of plies can be varied. You only pay for the protection you need—and no more.

Soft fine powders, for instance, packed (by Bowater machinery, for preference) and dispatched for almost immediate use, may well be sufficiently protected by a simple two or three-ply

Immediate delivery— *or long storage?*

sack. On the other hand, a sharp edged crystalline substance, destined to be stacked high and stored for long periods, will require several layers of protection. Tough Kraft paper—bitumen laminated or combined with glassine or polythene—may be used to build up the strength and special protective properties of the multiwall sack.

What protection does your product require? Bowaters can advise and their advice will make sure that you do not pay more than you need.



Jagged granules— *or soft powders?*

Bowaters make FIBRE DRUMS, MULTIWALL SACKS, PROTECTIVE PACKAGING PAPERS, CORRUGATED CASES, PAPER AND FILM BAGS *and will be glad to tell you more about their advantages in your business.*

Please write to: **Divisional Sales Manager, Packaging Division, Bowater House, Stratton Street, London W.1 GRO: 4181**

YES SIR! THE NEW PLANT IS RUNNING SPLENDIDLY BUT—
THESE SET-BACKS WERE HAVING ARE DUE TO POOR QUALITY CLOSURES- WITH SO MANY DELAYS AND STOPPAGES!
THAT WONT DO!
GET ME U.G.B. CLOSURE DIVISION IMMEDIATELY— I'LL SOON PUT PRODUCTION BACK ON TOP— WE CAN'T WAIT FOR A BOARD MEETING!
THAT PROMPT ACTION HAS SAVED OUR LIVES!
YES SIR!
THINGS ARE RUNNING SMOOTHLY AT LAST- THANKS TO U.G.B. REMEMBER THESE AUTOMATIC CAPPING MACHINES MUST HAVE CLOSURES
OF CONSISTENT ACCURACY
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UNITED GLASS BOTTLE MANUFACTURERS LTD

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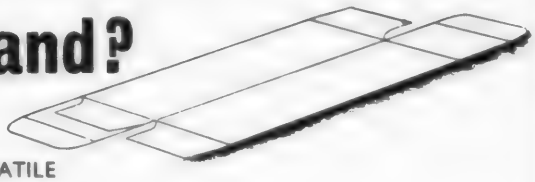
Telephone: GERRARD 8611 (18 Lines) *Telegrams:* UNGLABOMAN, LESQUARE, LONDON

Are YOU wasting time and money doing this by hand?



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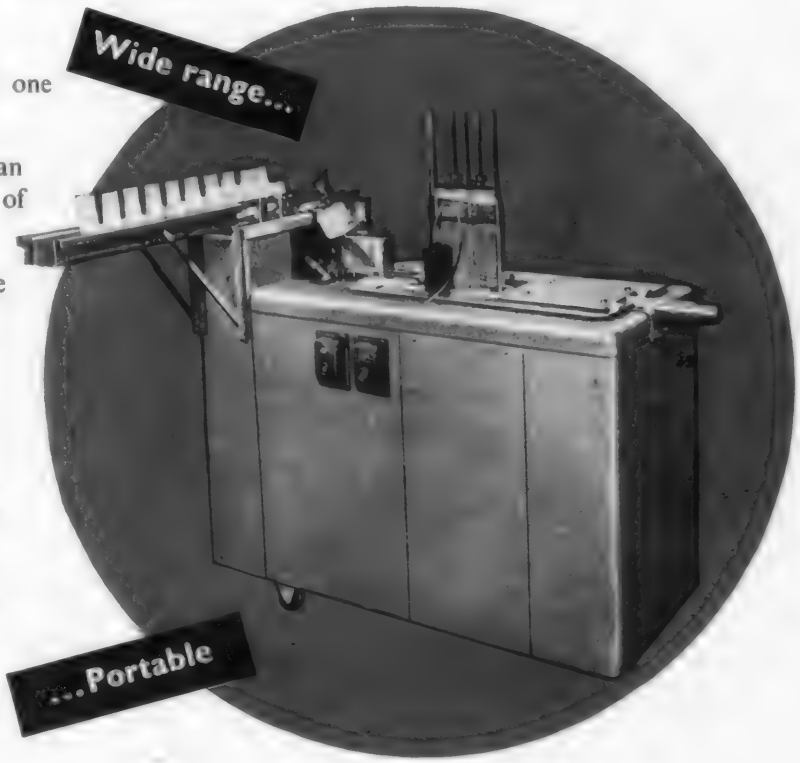
TUCK-O-MAT & CONVEY-O-MAT

AUTOMATIC MACHINES FOR ERECTING REVERSE-TUCK CARTONS

- Needs only the part time of one operator.
- Remarkable versatility. You can set up any size or shape of tuck-end carton.
- Changeover to different size takes only 10/20 minutes. Change parts inexpensive.
- Mounted on rubber wheels—one person can move it.
- Simplicity in design and construction reduces maintenance costs to a minimum.
- Saving in wages alone soon repays outlay.



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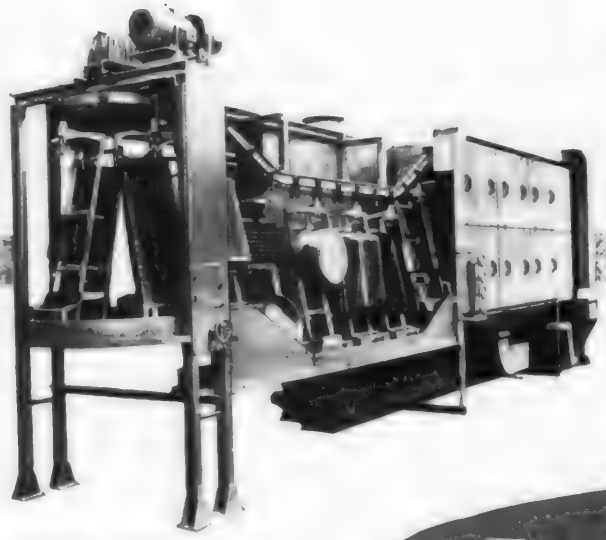
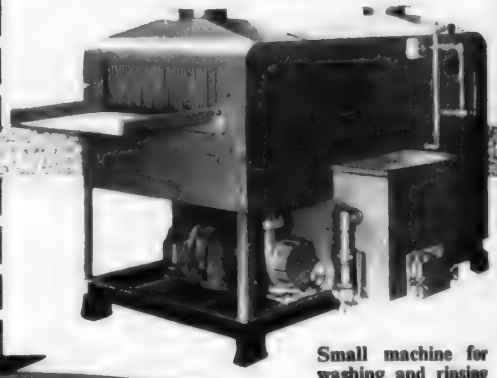


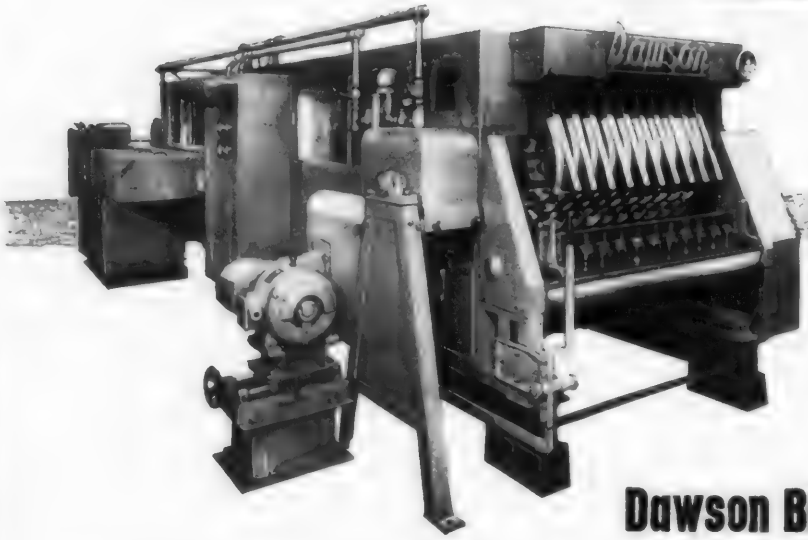
A monorail machine for washing, rinsing and drying varied Food Utensils.



Small machine for washing and rinsing Bakers' Trays.

ESTABLISHED 1864

The Quick, Economical
Dawson
Hygienic way



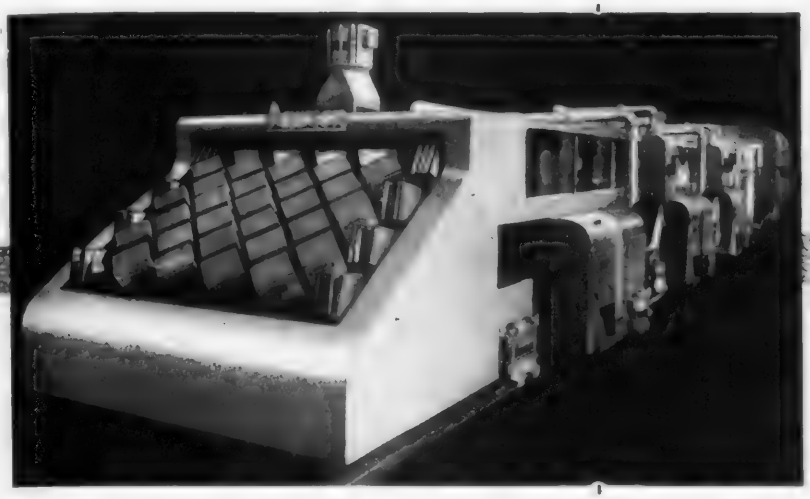
A Bottle and Jam Jar washing, de-labelling, rinsing and sterilising machine.

Tel.: Cleckheaton 1080 (5 lines)

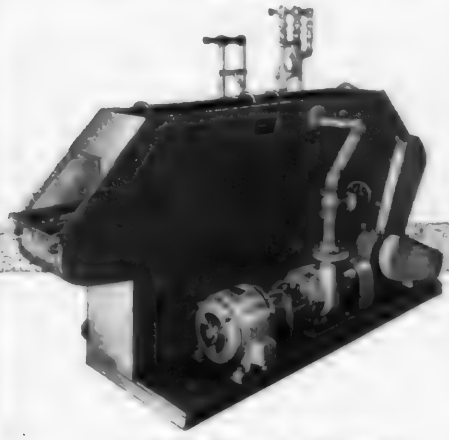
Dawson Bros. Ltd., Gomersal, Nr. LEEDS

CLEAN

Washes, rinses and sterilises 200—300 trays per hour.



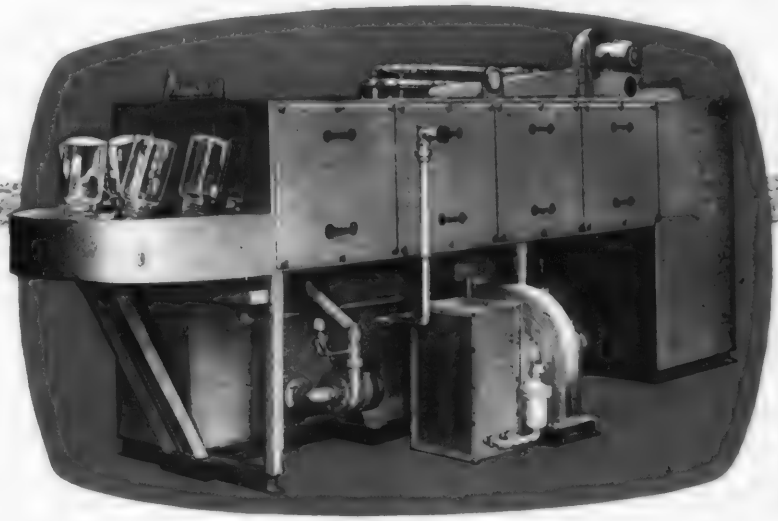
For washing and de-labelling and drying biscuit tins and lids. Capacity 2,000 per hour.



Small Can Washer and Rinser for 30—60 cans per minute.

Make sure that every type of container and utensil used in the manufacture of Food Products is clean, sterile and satisfies Health Regulations.

Dawson washing plant is used extensively today by manufacturers of all types of Food products. Whatever the size or shape of tin, can, tray, jar, bottle, container, mould or food utensil Dawson machines will wash and dry these articles in the minimum time for the lowest cost. Let us know what you have to clean and we shall be pleased to advise you.



A Rotary Jar and Tin washing and drying machine. Capacity 150 per hour.

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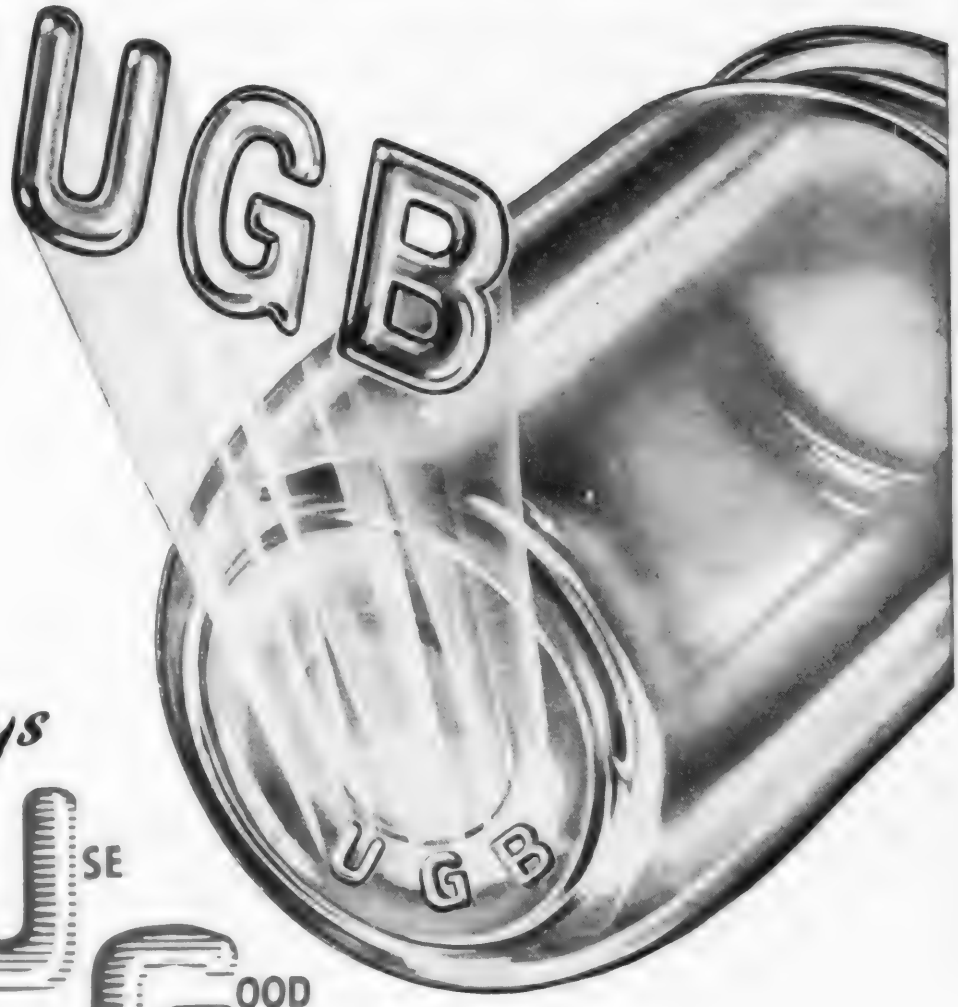

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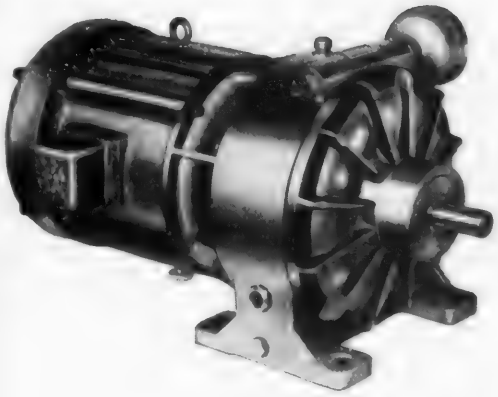

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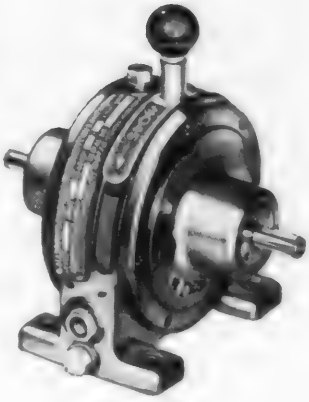

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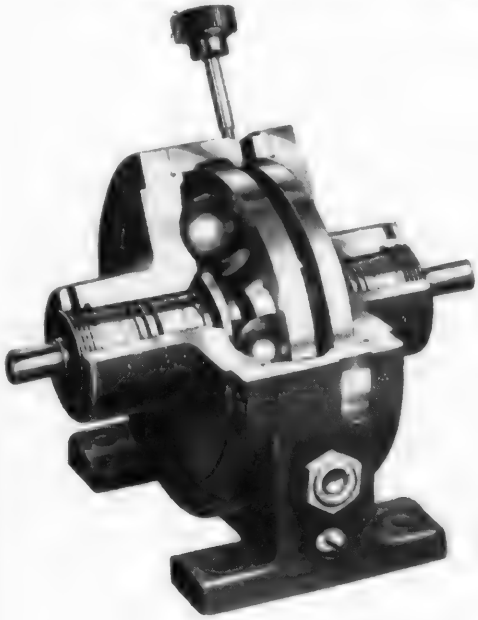

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against these thieves!

Flour beetle.
(Actual size approx. 4 mm.)

Cacao moth larva.
(Actual size approx. 11 mm.)

Policemen won't keep insect pests away from your valuable food stocks. Hygiene and cleanliness will help, but for absolute security you need your own "police force".

A "Pybuthrin" Insecticide is the answer

PYBUTHRIN is a mixture of piperonyl butoxide and pyrethrins. It is the active principle of a range of potent, easily applied insecticides, which are safe to use in the presence of foods yet produce a much greater kill than preparations containing an equivalent amount of pyrethrins alone. Different formulations and methods of application may be required for different insects and circumstances. Write for a copy of the booklet listed below which applies to *your* business.

"Pybuthrin" Insecticides for:—
1. *Pests of Cereals & Cereal Products.*
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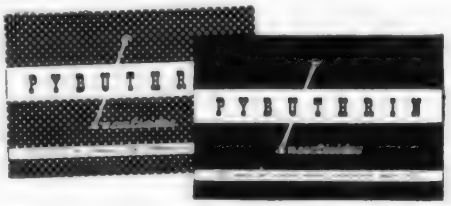
PYBUTHRIN

(Containing African pyrethrum synergised with piperonyl butoxide)



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B.H.C. 2008 which gives the very highest degree of action against micro-organisms, including yeasts and moulds, as well as exceptional wetting power, is completely rinsable. For further details of this great new development, ask for our Technical Representative to call and discuss the matter fully.

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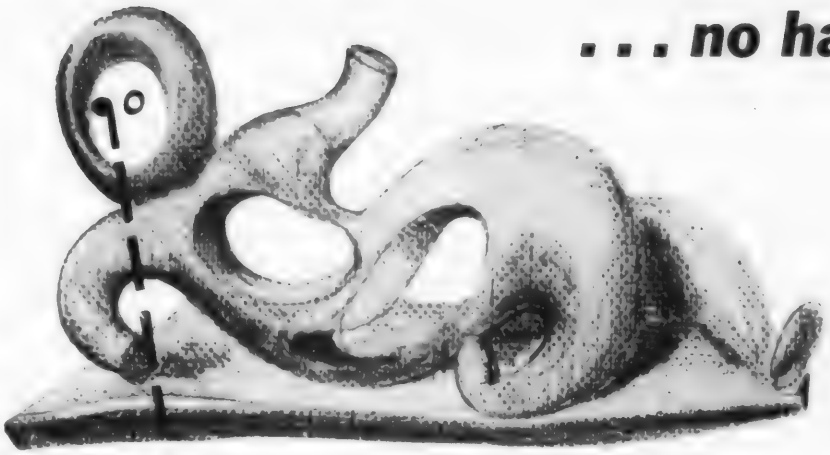

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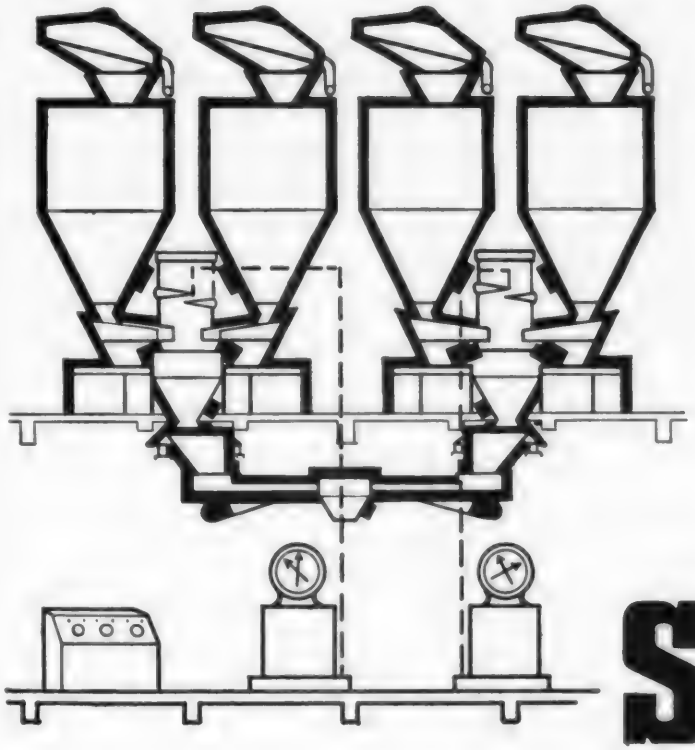

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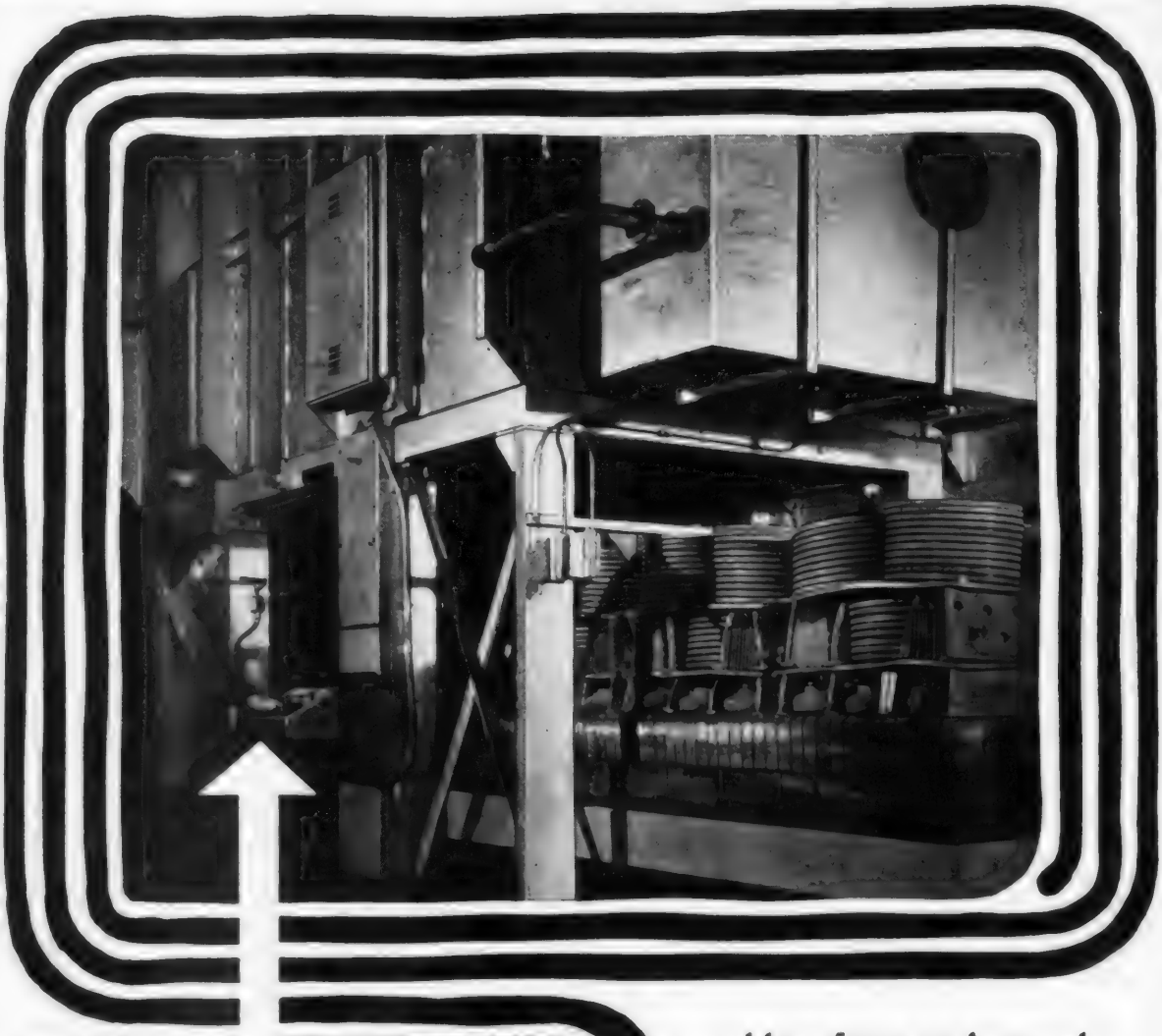

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E.D.A. are publishing a series of books on " Electricity and Productivity ". Four titles are available at the moment; they deal with Higher Production, Lighting, Materials Handling, and Resistance Heating. The books are 8/6 each (9/- post free) and the Electricity Boards (or E.D.A. themselves) can supply you.

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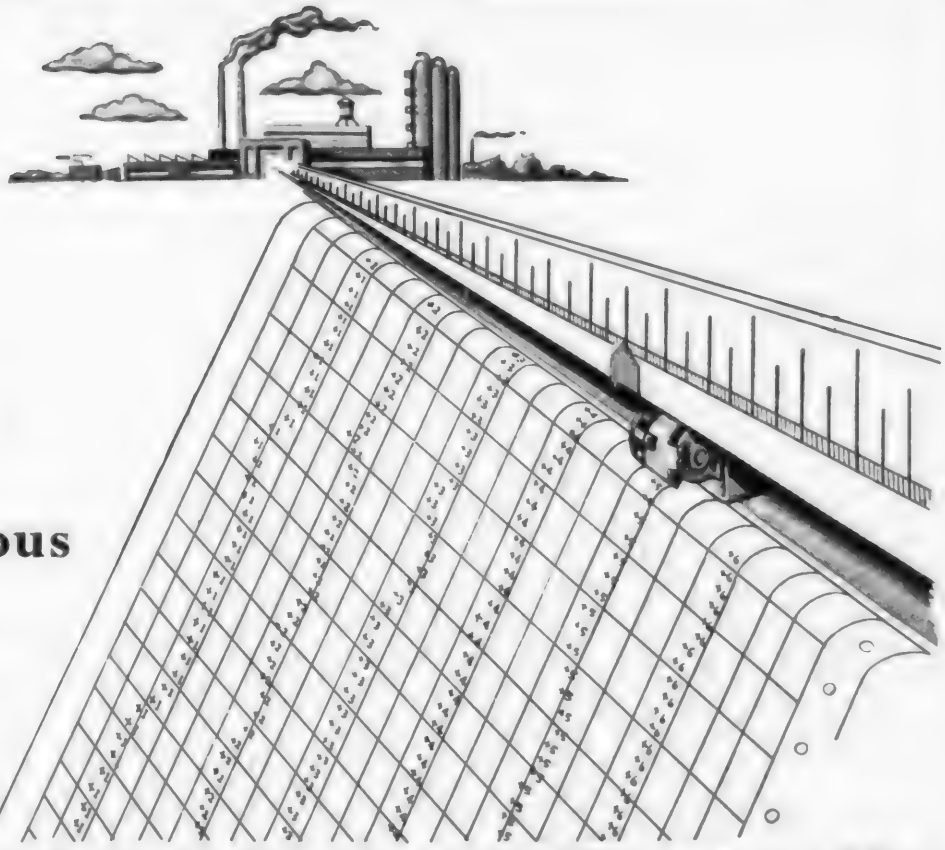

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... Multiple-record Electroniks

This ElectroniK Recorder will do the work of up to 16 single record instruments; it can provide you with 2, 3, 4, 6, 8, 12, or 16 continuous records of any variable which can be transmuted to electrical units.

Printing can be either *Cyclic* or *Synchro-Balance*. The latter, an exclusively Honeywell printing feature, accommodates rapidly changing variables by permitting each point to be printed immediately the instrument comes into balance.

High print wheel speeds giving full scale travel in 2 seconds are available. If required, points can be printed at 1·2 second intervals. And ElectroniK Multiple-Point Recorders have the familiar advantages common to all ElectroniK instruments—"continuous-balance" operation—rugged construction—freedom from mounting limitations—continuous measurement—unique accuracy—and very few servicing requirements.

For full details of these industry-proved instruments write for Specification Sheet 165 to Honeywell-Brown Ltd., 1 Wadsworth Road, Perivale, Greenford, Middlesex.

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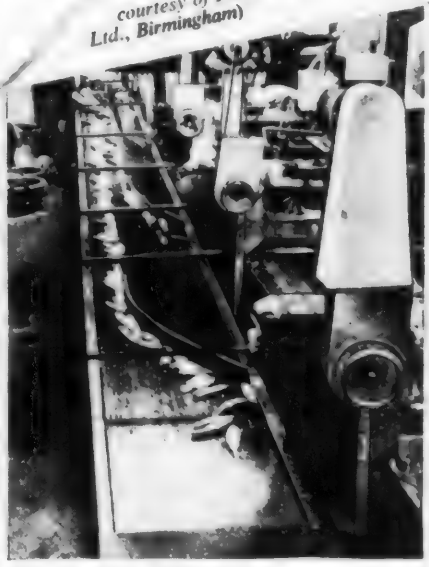
First in Controls

SCANDURA P.V.C. belting

helps the food industry

Cake packing on a 'Motaveyor' (by courtesy of Knightsbridge Cake Limited, Manchester)

Fruit bottling on a 'Motaveyor' conveyor (by courtesy of J. Mawdsley Ltd., Wigan)



Scandura conveyor in a fish canning factory (by courtesy of Fisher & Ludlow Ltd., Birmingham)

As the pioneers of P.V.C. covered conveyor belting British Belting & Asbestos have supplied their SCANDURA belting for many varied applications. Due to its resistance to contamination and its hygienic qualities SCANDURA has become the obvious choice for food conveyor belting. Its lasting qualities had already been proved in food factories two years before its first introduction in Britain's coal mines in 1948, and its fire resistant properties have brought a hitherto unknown safety margin where conveyor fire hazards originally existed. SCANDURA is available now, in varying widths and thicknesses to suit all applications.

SCANDURA P.V.C. BELTING IS MANUFACTURED BY **BBA**

BRITISH BELTING & ASBESTOS LIMITED · CLECKHEATON · YORKSHIRE

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Products handled include:

- *Synthetic vitamins*
- *Custard powder*
- *Moulding starch*
- *Starch & dextrines*
- *Cocoa*
- *Flour*
- *Sugar*

The Simon Junior Sifter has grown to be a big name in the food and confectionery world. This le ss than-four-feet-square machine is now screening, grading and sifting flour, cocoa, starch, icing sugar, etc. in plants all over the country. The persuasive rotary motion of the horizontal sieves gives a gentle but positive separation of powders and granular materials, with through-puts up to three tons per hour. Its totally enclosed metal body means absolutely dust-free operation. Interchangeable aluminium trays and easily removed "drawer-type" sieves add to Junior's efficiency and simplicity.

We will have a stand at the International Bakers' and Confectioners' Exhibition at Olympia, October 1st to 6th. See a selection of our latest developments on Stand 3, Row P, on the first floor of the Empire Hall.

Send now for the free Simon Junior Sifter folder

Industrial plant by Henry Simon Ltd

SIMON ENGINEERING GROUP

STOCKPORT, CHESHIRE. *Telephone:* Gatley 3621.

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Acacia ✕ Karaya

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On our modern grinding plant, we produce all grades from kibbled or coarse to the finest powders.

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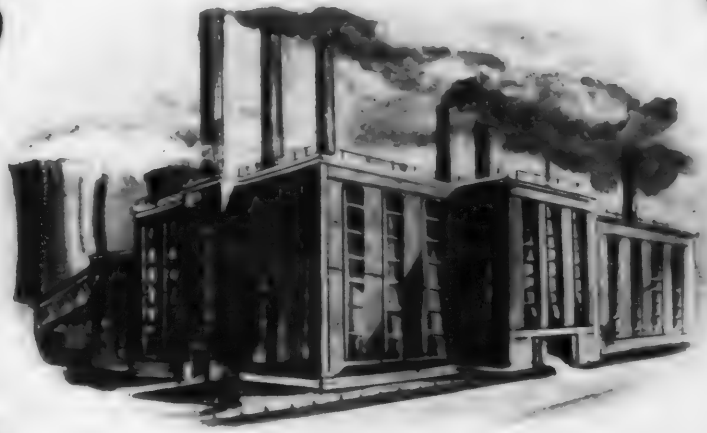
The advantages of

REDLER CONVEYORS IN INDUSTRY



The principles upon which REDLER machines operate are different from other plants used for the same purposes, but in actual fact are merely practical applications of natural laws. Materials of powdered, granular, flaky or small lumpy formation, such as grain, coal, cement, are caused to flow like a liquid through enclosed dust-tight casings in any required direction by means of skeleton type links, and in such a manner that there is no pressure on the materials, no movement between the particles and consequently no breakage whilst in transit.

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REDLER EN-MASSE CONVEYORS AND ELEVATORS

CONVEY AND ELEVATE IN ANY DIRECTION

TOTALLY ENCLOSED

CLEAN — NO SPILLAGE

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FEED THEMSELVES MEASURED LOADS

CANNOT BE OVERLOADED

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LARGE CAPACITY — LOW SPEED

LONG LIFE — LOW MAINTENANCE

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Braby stacking trays

for hygienic handling of meat

These trays are light, strong and designed to facilitate cleaning and sterilisation. They are made in one-piece pressings from an aluminium alloy specially resistant to corrosion. Trays are supplied with or without ventilating louvres and the tray bottoms are available pierced or slotted for drainage.

Supplied in two sizes:

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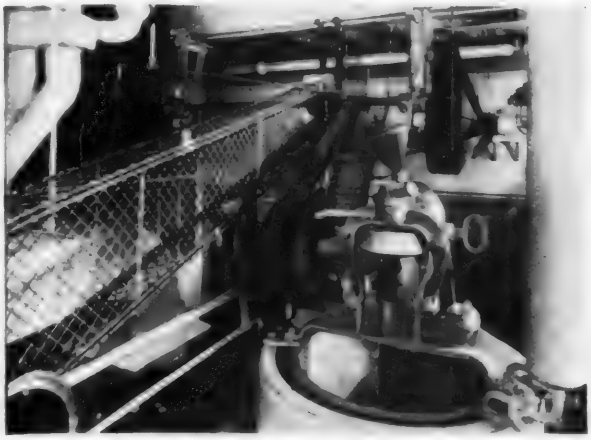

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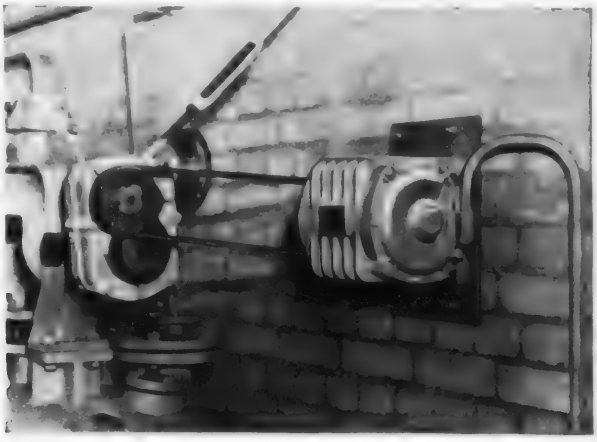

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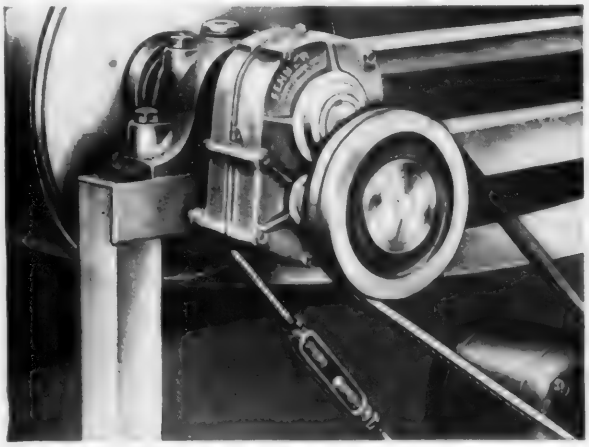

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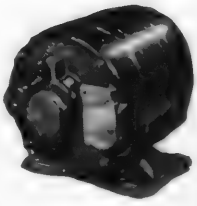

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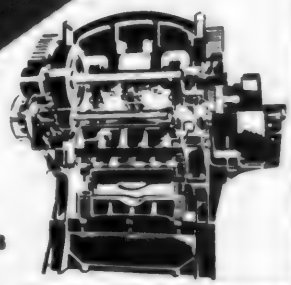

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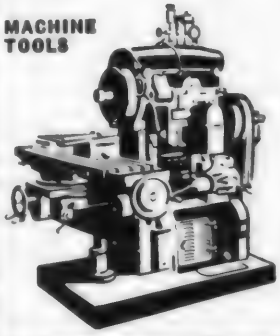

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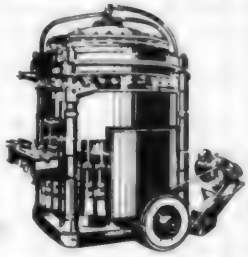

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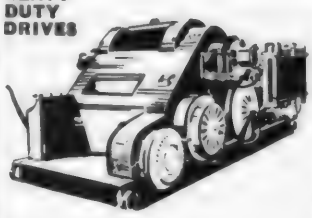

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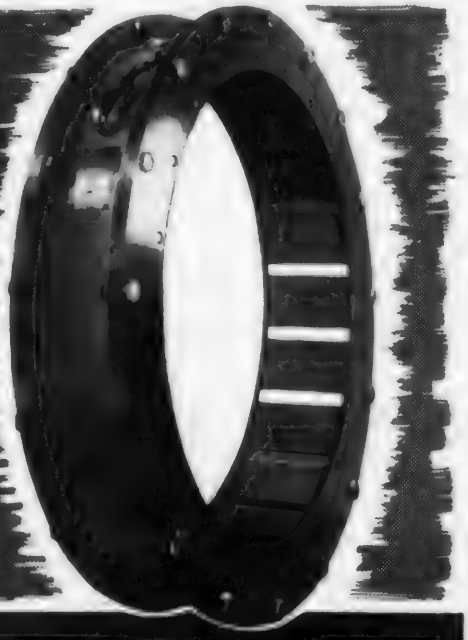

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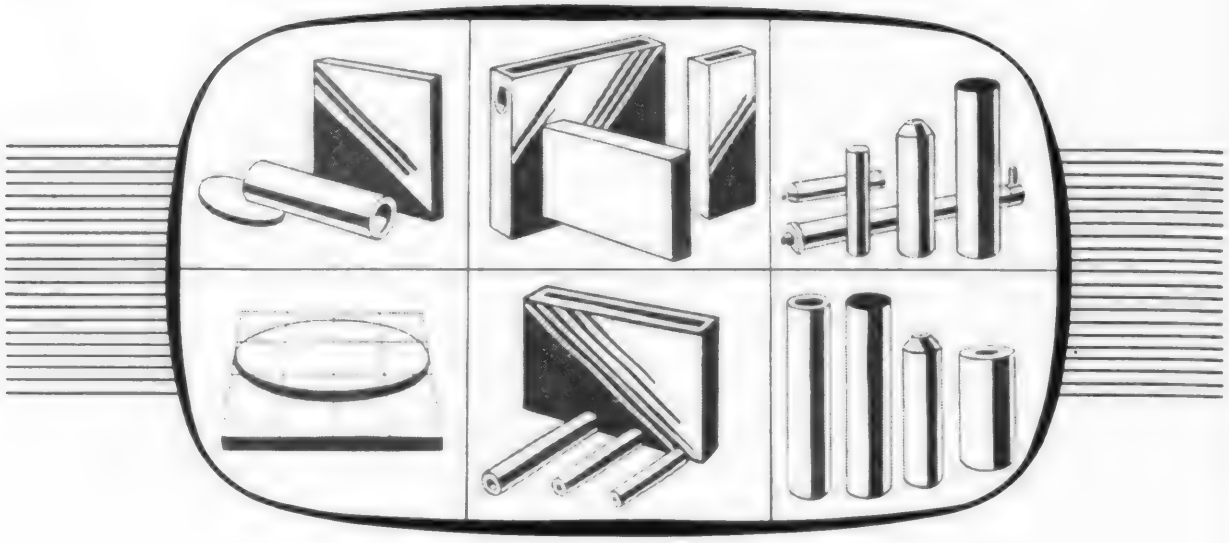

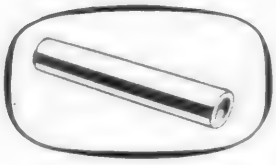

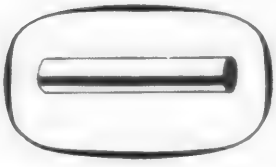

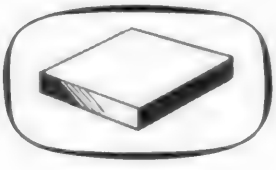

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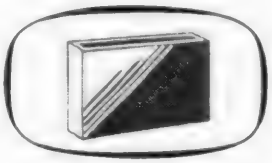

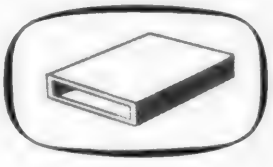

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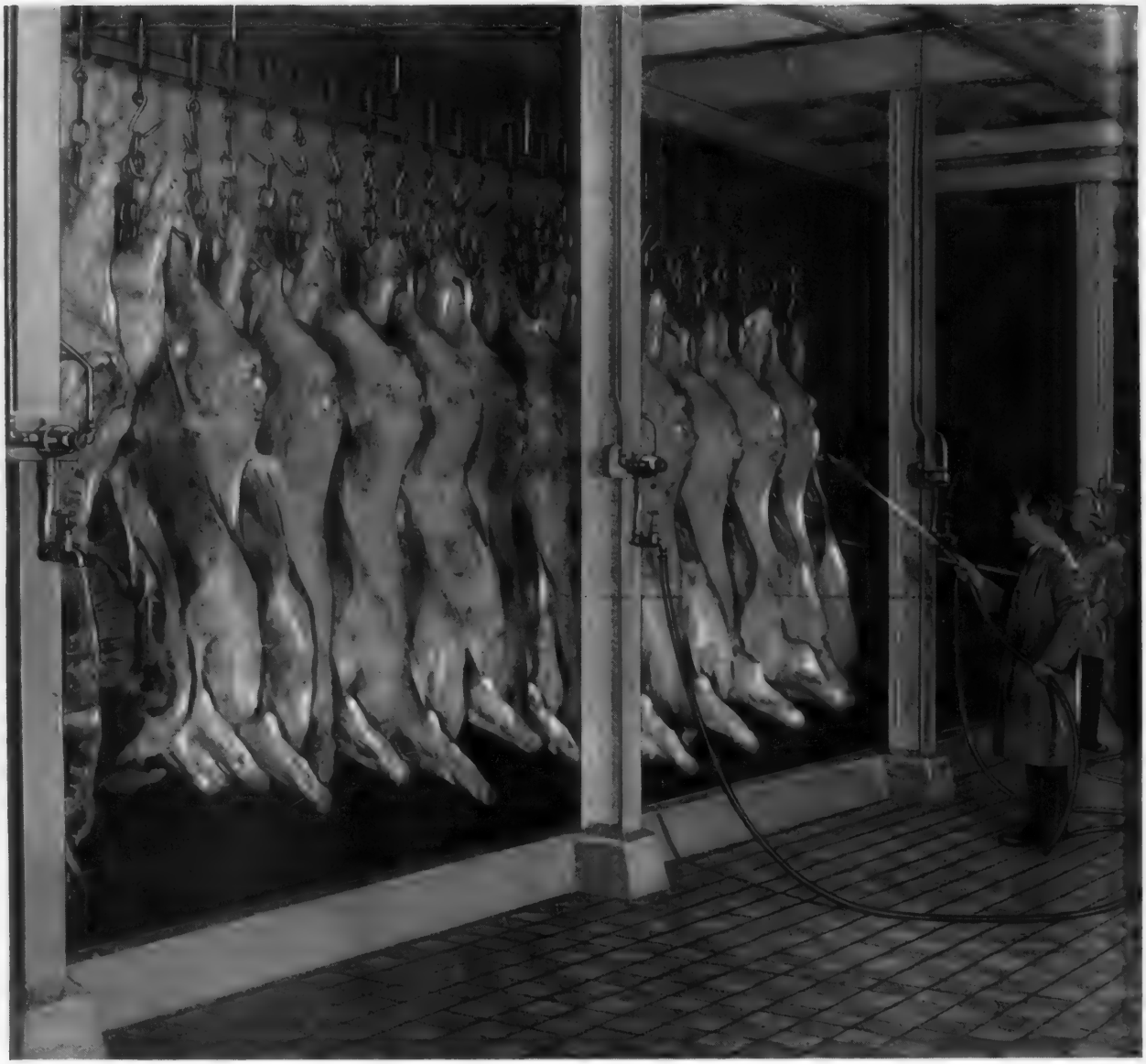

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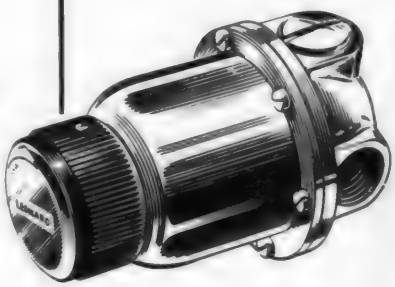

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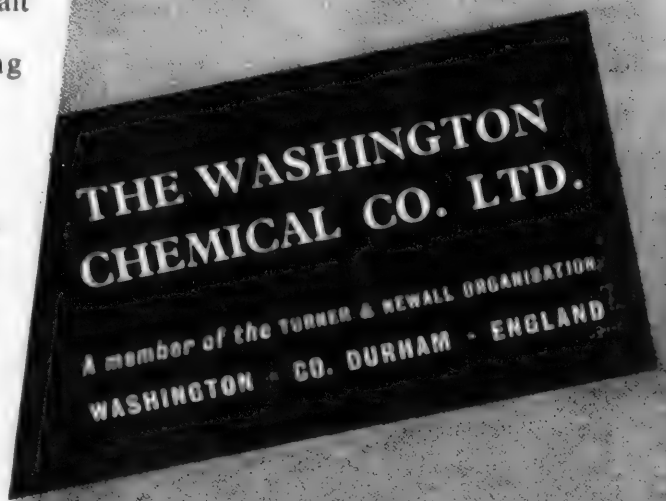

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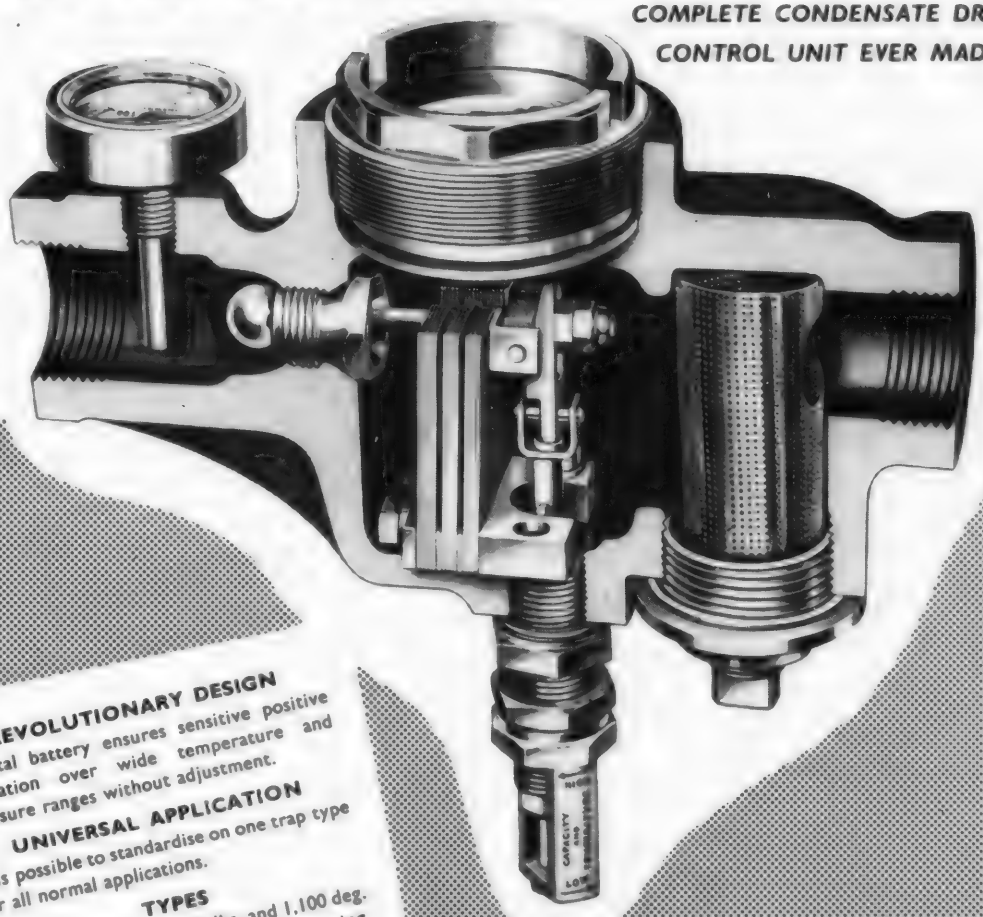

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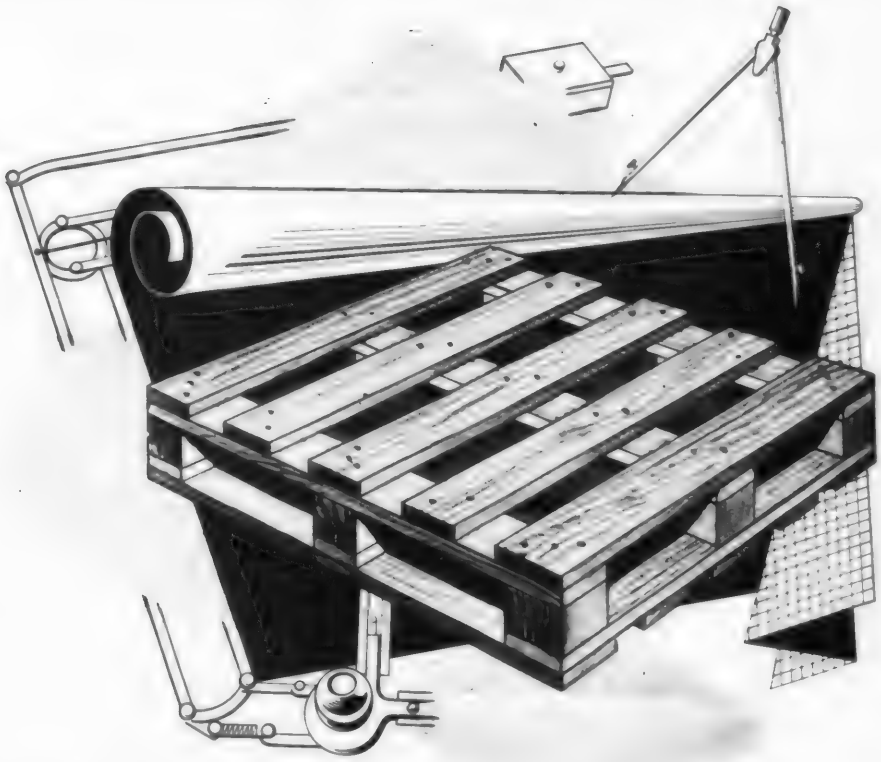

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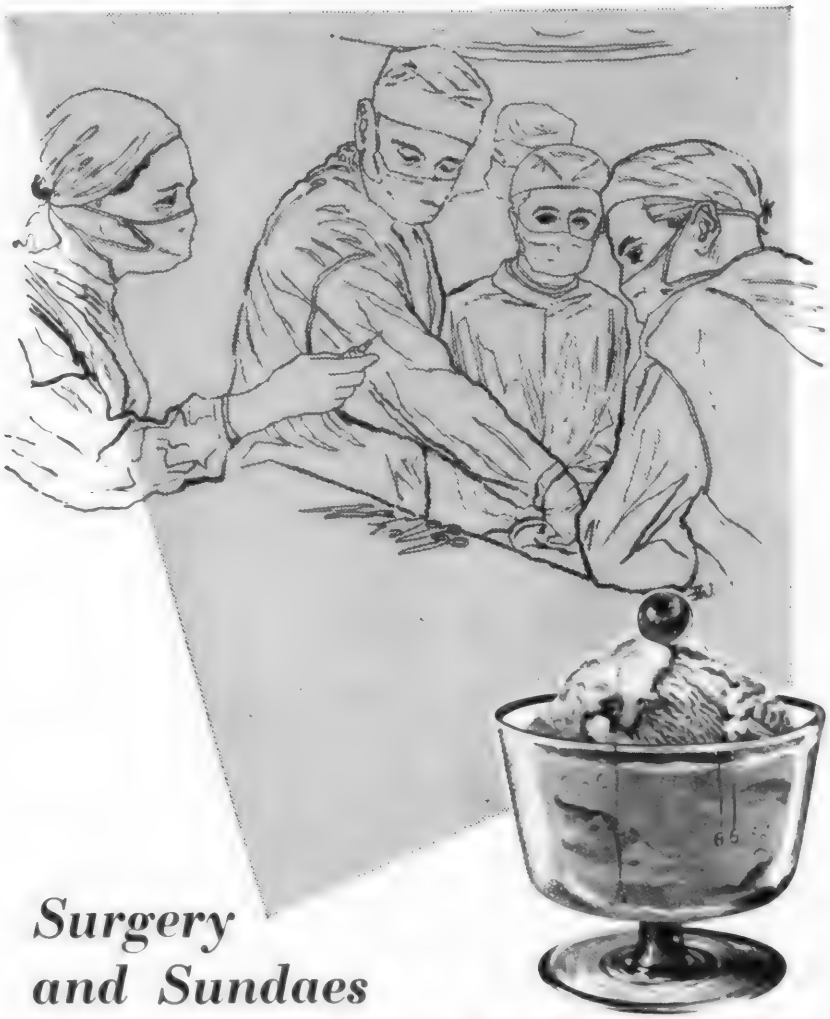

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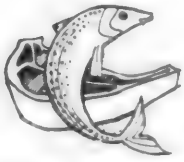

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FOOD MANUFACTURE

Vol. XXX, No. 9 September 1, 1955

Biological testing of additives

FOR some months the food industry has been talking about biological testing of food additives—colours, flavours, preservatives, etc. Discussion was no doubt stimulated by the proposals for a permitted list of food colours put forward by the Food Standards Committee earlier this year. In their report the Committee emphasised the difficulty of making thorough biological tests of food colours and hinted that better facilities for this important work should be provided.

There are three parties to any scheme for establishing testing facilities of this kind: the food industry, the chemical industry and the Government. Many people in the food industry think that these three groups should co-operate to establish a biological testing and research station for food additives. This opinion was put forward by the retiring chairman of the council of the British Food Manufacturing Industries Research Association, Mr. E. E. Wells of Rowntree and Co. He said that the association could not undertake biological testing without a considerable expansion of its laboratory accommodation and staff at Leatherhead and thought that the answer was a completely new co-operative testing station. He disclosed that the interested parties have already held a meeting at the Department of Scientific and Industrial Research where they were told that the Government might make a grant towards the cost of the new station. While expressing the hope that this grant would be generous, Mr. Wells made the important point that there are many good reasons why this type of testing should not be carried out entirely under official auspices. It was vitally necessary that interested industries should have a major share in the management of any such establishment. But industry could not be expected to achieve control unless its financial contribution warranted it.

This is the right attitude. Now that the idea of testing facilities has been accepted by industry and the Government it remains for detailed plans to be made. The size of the establishment and the speed with which it will be created depends upon the money available. We hope that Mr. Wells' comments will be taken to heart by all concerned and that individual managements in both the food and chemical industries will make generous contributions so that an establishment worthy of its important purpose can be set up.

In another note we point out that it is just 100 years since Dr. A. H. Hassall published his classic exposé of food adulteration that started an uproar which led to the first Food and Drugs Act. It would be entirely appropriate for this centenary to be recognised by the establishment of new facilities for ensuring that the food industry uses only those additives whose harmlessness has been convincingly proved by the best tests available.

Brighter carbohydrates

PERHAPS one of the first problems to be referred to the proposed biological testing station is whether brighter, whiter foods are good for us. If the phrase is reminiscent of soap powder advertising, it is not accidental, for the additive which is claimed to brighten and whiten flour, sugar and other carbohydrates is a blue fluorescing substance, similar in function although not necessarily in chemical structure to the "optical bleaches" which are added to soap. The process is disclosed in a new British patent (733,860) granted to Ciba Ltd., the Swiss chemical company.

The additives are coumarin derivatives which exhibit a blue fluorescence and contain a basic amino group in the 7-position. They are said to be non-toxic in the quantities at which they are effective, namely 0·001 to 0·5% by weight.

Foods which are said to be suitable for treatment are cane and milk sugars, cereal flours, potato flours and "flours from any other plant products." Suitable amino coumarin derivatives are claimed to be those in which the amino group is primary, secondary or tertiary, *e.g.* 7-ethylamino-coumarin, 7-diethylamino-coumarin and 7-(benzyl-ethyl)-amino-coumarin.

The fluorescent compounds are either mixed with the carbohydrates or the foods containing them by grinding the dry ingredients, or mixed with the foods in the course of preparation. Thus they can be mixed with the flour while it is being ground or

added to aqueous preparations such as dough. The specification gives several examples for brightening dough, flour, glucose and sugar.

No claims are made for anything but the improved appearance of the foods.

Attack on adulteration

JUST 100 years ago came an event in food history with far-reaching effects on the Briton's health. This was the appearance in 1855 of a book called "Food and its Adulteration." The author was Dr. A. H. Hassall, an analyst who had been patiently collecting such overwhelming evidence on the evils of adulteration that when his book appeared a Select Parliamentary Committee was formed to enquire into the subject. Hassall's technique was far in advance of that used up to his day; he showed the value of the microscope in detecting adulteration.

The eighteen-hundreds had seen some awakening to the problem before Hassall put things more on a scientific basis. Accum, who was "chemical operator" at the Royal Institution and an assistant to Davy, published a work in 1820 in which the common adulterants like alum in bread, copperas in beer and capsicum in mustard, and the tricks of the trade among London brewers, were exposed. There was also an anonymous booklet entitled: "Deadly Adulteration and Slow Poisoning; or Disease and Death in the Pot and Bottle" published by "An Enemy of Fraud and Villainy," a work which painted things in too lurid colours to be convincing. *The Lancet* dismissed this as the work of "a well-meaning individual, but of that class of exaggerating alarmist who write in a tone of half-mad honesty"!

With Hassall in charge of analysis and a Dr. Letheby looking into the nutritional aspects, the need for improvement was realised. Hassall found that every single sample of loaves bought in various parts of London contained alum, even those coming from a League Bread Co. advertising all their products as being free from alum. Hassall later took out a patent for a dried meat called "meat flour," but he was not to win success as a food manufacturer in the same degree as he achieved as an author.

He gives an astonishing list of adulterated foods. Arrowroot, coffee, chicory, cinnamon, cayenne pepper, curry powder, ginger, milk, mustard, pickles, potted meats, preserves and pepper, and so on right through the alphabet. While tea escaped lightly with merely sycamore leaves as adulterants, there was a whole chemist's stock in the other addenda, including Prussian blue, black lead, ground glass, copper arsenite, chromate of potash, red lead, vermilion and Venetian red. Five years after Hassall's damning evidence came the first Food and Drugs Act to protect the poor Briton's stomach.

Science and herrings

RESEARCH and development work is not the primary function of the Herring Industry Board, which is concerned mainly with the catching and marketing of fish. However, the Board does sponsor research by appropriate organisations, and helps with the subsequent development of their findings. Their co-operation in this respect with the Torry Research Station is mentioned in the report of the Food Investigation Organisation, see August issue, p. 331, as an example of teamwork between a research organisation and industry. The twentieth annual report of the Board shows that one of their scientific staff is a co-inventor of the electrostatic method for smoking fish described by the Torry Research Station, while most of the work on a process of judging, by fluorescence in ultraviolet light, the amount of smoking a fish has undergone was carried out by employees of the Board.

Another example of the Board's participation in research is an investigation of problems associated with canning herrings, in conjunction with the British Food Manufacturing Industries Research Association and the Torry Research Station. A Technical Advisory Committee has been established to advise research workers on technical problems connected with the kipper industry.

Butter breaks a golden rule

AN ARRESTING exception to the rule that retail sales of goods in universal use bear a very close relationship to the expenditure on advertising them has emerged from the latest survey of the market status of butter and margarine. According to these statistics, which were collected for the Butter Information Council, margarine sales should be almost ten times as large as those of butter if the advertising-sales ratio was uniformly reliable. From an estimate of the gross advertising appropriations for the two fats it is shown that only 0·175% of the retail value of butter is devoted to advertising, while the proportion for margarine is 1·54%. Yet margarine, despite the much greater expenditure on advertising, is calculated to command only some 60% of the total market for the two table fats, which during 1954 averaged about 14,100 tons a week, butter's 40% share now brings it to within 30% of its pre-war sales, when it cost 1s. 4d. to 1s. 7d. per lb. and margarine was selling at 7d. to 8d.

By contrast, margarine sales appear to be strongly dependent upon advertising. Impressed by this the Butter Information Council is urging the contributory countries—New Zealand, Denmark and Australia, who collectively supply 89% of our butter—to increase future advertising of all kinds by about 50%.

Indian canning enquiry

THE concern of India's food technologists with the state of her fruit and vegetable preservation industry is expressed in the report of an enquiry published by the Central Food Technological Research Institute, Mysore.

Making a plea for state subsidies, the committee which conducted the enquiry points out that in almost every country where horticulture is an important industry, the fruit and vegetable preservation industry receives government aid in some form. The annual production of fruits and vegetables in India is about 13 million tons (as against 30 million in the U.S.A. with less than half the population), and the committee estimates that the preservation industry would need at least 2,500 factories each with a daily production capacity of 5 tons to take care of even 25% of this produce. In fact there are hardly 600 licensed fruit and vegetable preservation factories in the country.

Development of the industry in the second Five Year Plan is urged and the formation of a National Board to work in co-operation with Government departments and industrial institutions is suggested.

Apart from these proposals, several problems of the industry requiring immediate attention are considered, principally the high costs of sugar, containers and freight. In a country the size of India freight is a great problem. Transport charges from Allahabad to Bombay are almost the same as those from Bombay to London.

Food preservation in India is subject to a number of special problems. The average Indian is bound by regional and traditional food habits and he is often extremely poor. The problem of feeding her vast population would certainly be eased if India had a flourishing food preservation industry.

Bacteriology and the baker

NEW RECOMMENDATIONS for baking meat pies are made in a report published by the Ministry of Health which describes the investigation of an outbreak of food poisoning in Lancashire in June 1953. The organism responsible for the outbreak—which caused five deaths and over 1,000 notified cases—was *Salmonella bovis morbificans* and the cause of the infection was the consumption of contaminated meat pies produced by one bakery. It is believed to have been one of the largest outbreaks of salmonella food poisoning on record.

Besides stressing the importance of good quality meat and adequate hygiene facilities for bakery staff, the investigating team recommend that when slaughtering and baking are combined, the same staff should not work in both departments concurrently. They suggest that baking at 380°F. for 40 min. for 4-oz. pies and 380°F. for 35 min. for 2-oz. pies would produce an acceptable product and one in which salmonellae do not survive. After baking, pies should be covered and cooled fairly rapidly. Gelatin solution should be boiled for 5 min. after being prepared and should be kept in a closed reservoir at a temperature of not less than 170°F. Finished pies should be packed in sealed transparent covers. Adequate washing facilities should be provided for, *and used* by the bakery staff, preferably with the use of sterile paper hand towels or hot-air hand driers. All equipment and working surfaces in bakehouses should be so designed that they are easy to keep clean and are in fact kept clean.

In a preface to the report, Sir John Charles, the chief medical officer of the Ministry of Health, said that the traditional methods of baking pies provide only a small margin of safety should the contents happen to become contaminated. He described the report as bridging the gap between bacteriologist and baker and added that acceptance of the recommendations would go far to ensure the safety of meat pies.

Food trends in Western Europe

NOT ONLY is the average European spending more on his food, but he is more willing to buy the comparatively expensive foods, according to a new O.E.E.C. report on food and agriculture. This shows that the volume of goods and services consumed from year to year by households and individuals has, with practically no exception, increased in every country in every year. When the O.E.E.C. speaks of the "volume" of food it means not only the product at its point of origin, but also such services as transformation, processing, transport and wholesale and retail distribution.

The extra 2 million people a year which the O.E.E.C. countries have been receiving since the war ended account for some of this increased expenditure. Consumption of the more expensive foods such as meat, eggs, milk and dairy products is steadily developing, while the individual consumption of cheaper foods either remains constant or is declining. Improved forms of food—milk in hygienic bottles, better presentation of fruit, vegetables and dry goods, quickfrozen and prepared foods—are growing more popular.

In recent years the Western European consumer has been drinking substantially more milk than before the war and eating very much more fruit, vegetables and potatoes and a little more sugar, cheese, fats and oils (other than butter). Consumption of butter and eggs has been about the same as

before the war, meat substantially less and fish and bread a little less. However, the report suggests that potential demand should not be evaluated too rigidly in terms of pre-war consumption. There are no signs that any European country is returning to the dietary patterns it held before the war and when considering the most advantageous lines for production policy, the memory of pre-war levels should be replaced by a consideration of the levels of income, the age distribution of the population, family sizes and the development of food prices.

From rice bowl to bread bin

RICE, for centuries the staple food of the Chinese, is said to be gradually giving place to bread in their diets, acording to a Board of Trade report on the market for bakery equipment in Hong Kong. Only about 14,500 (excluding servicemen) of the 2½ million in the Colony are non-Chinese, yet Hong Kong's 32 bakeries employ about 1,500 workers and use 75 million lb. of flour annually.

The Garden Co. Ltd., the largest bakers, have mechanical kneading machines, air-conditioned fermenting chambers and oil-fired ovens with mobile baking shelves, but many of the otherwise quite large bakeries—including one producing 8,000 lb. of bread a day—have oil-fired brick ovens into which the bread is introduced manually. Most bakeries produce fancy bread and several bake excellent pastries and fruit cakes. Elaborately designed western style wedding cakes are quite usual.

Biscuits of all kinds are also popular. The Garden Co. has a large British biscuit-making installation on which the stamping and cooking machine has a chain, as distinct from plate, type conveyor. This plant can work on a 24-hr. basis and produce 10 tons of biscuits a day. Some other bakeries in the Colony have locally made or imported biscuit stamping machines, but as far as is known the actual baking is done in hand operated ovens. Chocolate coating in at least one of the largest bakeries is applied by the primitive method of holding the biscuit in wide-jawed wire tweezers and dipping it twice into a bath of chocolate.

Several of the bakeries also make confectionery and again much of the machinery is made locally. Toffee shaping and automatic wrapping machinery is imported but most sweet wrapping is done by hand. Some metal chocolate moulds are imported from Italy. Almond powder is in demand for drinking and for making into a soup. So far, no one seems to have produced a satisfactory almond skinning machine. At present, soaked almonds are rubbed between wooden boards.

Hong Kong is virtually a free port and there are no duties or quotas on imports of bakery equipment.

Fresh water problem

LIVING standards are rising and industrialisation increasing so much in the world in general that it is becoming a baffling problem to find enough fresh water to meet demand. Authorities in places as far apart as Norway and Australia, Hong Kong and San Francisco are discovering that they may soon have to think of using brackish water, perhaps even seawater itself. Great Britain is no exception, in spite of its rainfall. For instance, seawater is infiltrating into fresh water wells in the Thames estuary and it is becoming more and more difficult to suggest other sources that do not involve expensive, long-distance pumping. It is clear that work on improving and cheapening processes for turning brackish water into fresh is going to be more important as populations and factories increase.

Talks on the possibilities of various methods of desalting water have been going on for some time under the auspices of O.E.E.C. One promising process is electrodialysis—the removal of salts from a liquid flowing between pairs of ion-selective membranes, by means of an electric field. Research on this method is already well advanced in the Netherlands. The Dutch recently offered to carry out development work in co-operation with other countries showing an interest. Great Britain has joined the Netherlands, South Africa, Australia and Algeria (representing France) in paying for this work and it has now begun. The problems to be solved are mainly those of bringing up the process from small to large pilot plant scale. All the co-operating countries will share in the new knowledge and any patents that may be taken out in the future. Results which the previous Dutch work produced will also be shared between them. Manufacturing rights in any large scale process will be available to British industry on reasonable terms.

In this country, an Admiralty team has been working on scale and foam prevention in methods of distillation, a well established process. Outstanding results have been achieved in the Navy but the Admiralty, of course, has been working with seawater exclusively. D.S.I.R. has now given £5,000 to pay for an extension of the programme to cover other waters. Still in the exploratory stage are two other processes which the French have put forward as possibilities for co-operative research. These are certain aspects of ion-exchange and of solar distillation, which may be suitable for use in very hot, dry areas. No co-operative group to study these has yet been formed.

Any firm interested in de-salting, particularly evaporation and distillation procedures, or in electrodialysis, should get in touch with D.S.I.R., 5-11 Regent Street, London, S.W.1.

PREPARATION AND STORAGE OF *Soft Fruit Concentrates*

By A. Pollard, M.Sc., Ph.D., Margaret E. Kieser, B.Sc., A.R.I.C., and C. F. Timberlake, M.Sc., A.R.I.C.

(*Long Ashton Research Station, Bristol*)

In Britain the output of juices and syrups from home-grown soft fruits is still appreciably smaller than in such countries as Germany, Switzerland and the U.S. To achieve comparable development here, the first consideration must be high quality. Here the authors describe methods of preparing concentrates and give the results of recent storage tests they have carried out at Long Ashton.

THE commercial concentration of fruit juices goes back over a good many years but the present expanded rate of production dates from the last war. In Europe there was then an increase in the production of concentrates from apples and pears, but the methods used were mainly conventional and their wider application did not lead immediately to significant technical advances. The more recent developments in citrus juice concentration in the United States have had a more far-reaching effect, for they have raised the status of juice concentrates to a point where they can better compete with fresh juices.

The search for methods giving products of higher quality led to lower temperatures of concentration and lower degrees of concentration. The latter in turn called for lower temperatures of storage, which again provided conditions favourable to the retention of quality. However, the avoidance of heat treatment brought certain difficulties, for the lack of enzyme inactivation led to instability in cloudy pectinous products such as citrus concentrates. At the same time the absence of pasteurisation treatments made microbiological contamination a constant danger. The severity of these problems was to be seen from the number of publications on the subject. There now appears to be a movement towards flash-heating the juice or concentrate at some stage in processing.

Experimental mill and press in stainless steel used for fruit juice studies at Long Ashton Research Station, Bristol.

Future developments

It is doubtful if cold storage facilities in the United Kingdom would permit a distribution of deep-frozen concentrates to the consumer on a scale comparable with that in America: an increased use of concentrates in the factory, at an intermediate stage, would offer more immediate advantages. It could reduce the cost of bulk storage in the manufacture of juice products such as syrups and ready-to-drink beverages.

The output of juices and syrups from home-grown fruit still falls behind that in the U.S. and in some European countries such as Germany and Switzerland. The consumption of apple juice in the U.K. is low and the production of soft fruit juices, although more promising, lags behind that of

Germany where there is an annual production of some 2 million gal. Methods for the production of juices and syrups from these fruits were worked out at Long Ashton in the 1930s and they were in commercial production at that time. Up to the present the greatest use has been made of blackcurrants: raspberry and strawberry products are still capable of further development. Concentrated strawberry juices now appear to be finding ready acceptance in the U.S.A.,[1] raspberry products would possibly be more popular here.

The most promising outlets for fruit juices in the U.K. at the moment appear to be syrups or sweetened juices to be used as beverages, as sources of ascorbic acid, or as ice-cream and soda-fountain flavours. Diluted and carbonated juices, popular in Holland, would offer a further possibility: an obstacle to their wider production in the past has been the higher price of beverages with a pure fruit base.

Storage of juice

A big problem in the manufacture of juice products from soft fruits is the short period in which the fruit is available. Better methods of fruit storage may help to lengthen the pressing season but bulk storage of juice over the year is still needed. Juice concentration at this stage has the great advantage of reducing the volume to be stored. The best method of storage will need to be determined; several have been used in the past and they are outlined below:

1. Juices intended for sale as high gravity syrups can be sweetened directly to a sugar content giving stability against normal fermentation. A main disadvantage is the increase in bulk to be stored. The chance of spoilage by particular types of micro-organisms such as osmophilic yeasts is always present and it may become necessary to pasteurise or add preservative.

2. Tank storage of juice under carbon dioxide pressure at 0°C. by the Boehi method has been used successfully for the storage of blackcurrant juice[2] but the equipment is expensive. Refrigeration is essential if spoilage, mainly by lactic acid bacteria, is to be avoided: the original method of juice storage at normal temperatures with 8 atmospheres pressure has largely been replaced in Continental practice by storage at freezing point with 3 atmospheres. An alternative calling for less initial expenditure on plant is to flash-pasteurise the juice and to store under sterile conditions without pressure, but this may not eliminate the need for refrigeration. More interest is now being shown in this method for the storage of apple and grape juices and flash-heating has also been advocated as an additional safeguard to be introduced before Boehi storage.

3. Storage of juice at deep-freeze temperature avoids the need for high gas pressures and restricts chemical or microbiological changes. The main disadvantage is in the cost of refrigerating a large bulk of juice.

4. Preservation by the addition of sulphur dioxide is the simplest and cheapest method available and is widely adopted where regulations permit. The amounts permissible in the final product may limit the concentration that can be added during storage and this may be insufficient to guard against accidents of production. It may then be necessary to combine sulphiting with other methods of preservation such as flash-pasteurisation and refrigeration.

Storage of juice as concentrate has the main advantage that the volume to be stored is reduced and a relatively low degree of concentration will bring about a considerable saving in plant and equipment. Low gravity concentrates are as perishable as juices

Table 1.—Ascorbic acid retention during preparation of sweetened concentrates

	STRAWBERRY		RASPBERRY		BLACKCURRANT	
	Ascorbic acid (mg./100 ml.)	*% Theory*	*Ascorbic acid (mg./100 ml.)*	*% Theory*	*Ascorbic acid (mg./100 ml.)*	*% Theory*
Juice A	40·5	(100)	14·4	(100)	218·5	(100)
Juice B	43·5	(100)	16·1	(100)	230·5	(100)
Concentrate A/1	119	92	35	65	642	97
Concentrate A/2	117	91	40	75	681	99
Concentrate B/1	130	94	56	90	646	94
Concentrate B/2	130	99	58	93	608	91

A Juice extraction at low temperature
B Juice extraction at normal temperature
1 Concentration by freezing
2 Concentration by evaporation

Table 2.—Colour retention during preparation of sweetened concentrates
(Anthocyanin expressed as Spekker Units*)

	STRAWBERRY		RASPBERRY		BLACKCURRANT	
	Anthocyanin (juice dilution 1:5)	*Theory %*	*Anthocyanin (juice dilution 1:25)*	*Theory %*	*Anthocyanin (juice dilution 1:50)*	*Theory %*
Juice A	680	(100)	565	(100)	614	(100)
Juice B	647	(100)	604	(100)	592	(100)
Concentrate A/1	616	91	545	96	513	84
Concentrate A/2	539	79	500	89	460	75
Concentrate B/1	610	94	537	89	591	100
Concentrate B/2	580	90	547	91	545	92

* Optical densities measured at comparable dilutions following the method of Sondheimer and Kertesz (4) as modified by Meschter (5).

Table 3.—Ascorbic acid retention during storage of sweetened concentrates

(As % retained after 7 months)

Concentrate	STRAWBERRY		RASPBERRY		BLACKCURRANT	
	−23°C.	0°C.	−23°C.	0°C.	−23°C.	0°C.
A/1 ..	93	74	100	65	96	80
A/2 ..	93	75	103	63	93	80
B/1 ..	94	77	89	60	98	87
B/2 ..	89	78	93	71	102	92

Table 4.—Colour retention during storage of sweetened concentrates

(As % anthocyanin retained after 7 months)

Concentrate	STRAWBERRY		RASPBERRY		BLACKCURRANT	
	−23°C.	0°C.	−23°C.	0°C.	−23°C.	0°C.
A/1 ..	90	1	101	21	97	4
A/2 ..	93	1	103	31	93	4
B/1 ..	89	0	104	34	87	4
B/2 ..	90	1	93	43	72	7

themselves and call for similar methods of preservation. The main points to be determined are whether the juice of a particular fruit can be concentrated for storage without loss of quality and how the concentrate can best be preserved without deterioration.

Factors affecting the quality of concentrates

Tests made at Long Ashton in the early 1940s showed the need for the inclusion of the volatile essence fraction of the juice if the true character of the fruit was to be preserved in the concentrate, and this has since been emphasised by the extensive American work on full-flavoured juice concentrates. The methods of concentration to be used will vary in some degree according to the nature of the fruit itself. The juices of some fruits such as the strawberry are particularly susceptible to flavour change[1] and processing methods may need to be adjusted accordingly. Blackcurrant juices appeared more liable to deterioration than apple juices, if given excessive heat treatment during processing; and tests made in 1952 and 1953[3] showed that the blackcurrant concentrates of highest quality were those made at the lower temperatures. The superiority of the freeze-concentrate may also have been due to some extent to the more quantitative retention of the volatile components of the juice.

Later tests showed clearly that the retention of fruit character during concentration was of little use if storage conditions were unsatisfactory. Concentrates remained stable if stored at −23°C. but after a few months' storage at 0-2°C. deterioration began to be apparent and at 18°C. it was considerable. The first changes noted were losses of colour and of ascorbic acid: flavour changes followed. The addition of sulphur dioxide delayed these changes to some extent.

Preparation of concentrates

Further tests of a wider range of products were made in 1954 when concentrates were prepared from blackcurrant, raspberry and strawberry juices. The juices were extracted after the addition of depectinising enzyme (*Pectozyme*) to the fruit, the removal of pectin being allowed to proceed at room temperature or at temperatures below 10°C. The filtered juices were concentrated by two methods, by evaporation at 40°-45° in a laboratory climbing film evaporator fitted with a volatile-stripping device, and by freezing, the concentrate being separated from the ice by filtration with slight suction. By either method concentration was not taken beyond 5-fold giving specific gravities ranging from 1·155-1·244. Samples of each concentrate were stored at −23°C. and further samples brought to a specific gravity of 1·325 by adding cane sugar were stored at −23°C. and at 0-2°C. The samples were stored in screw-capped or crown-corked glass bottles with a small air space.

Analyses and tasting tests were made on the fresh concentrates and after periods of storage extending to 7 months. The products as made were of good quality and free from cooked or pasteurised flavour, but the intensity of flavour after dilution was slightly less than that of control juice samples kept in deep-freeze. The flavour of the raspberry concentrate was outstanding and received favourable comment from outside observers.

The adoption of low temperatures in juice extraction was beneficial in the preparation of strawberry concentrate, giving an improvement in colour and flavour. It was otherwise a disadvantage, for the longer time needed for depectinisation led to greater losses of ascorbic acid in all juices (Table 1).

The method of concentration had little effect upon ascorbic acid content except in raspberry products where heat treatments were beneficial (Table 1). Concentration by freezing gave a better retention of colour (Table 2); the effect on flavour was inconclusive. The freeze-concentrates were slightly inferior in flavour to the previous series prepared on a larger scale by the courtesy of Dr. R. Gane at Cambridge.[5, 6]

Storage of concentrates

The behaviour of the concentrates on storage is illustrated by the figures for ascorbic acid and colour retention in Tables 3 and 4. At deep-freeze temperature the losses of ascorbic acid after 7 months were small or within the experimental error. At 0°C. losses were up to 40% and varied according to the fruit: raspberry concentrates were the least stable and blackcurrant concentrates the most stable. The colour of the concentrates showed marked changes according to storage temperature. At deep-freeze temperature colour losses were small except in the blackcurrant sample that had received the greatest heat treatment (B/2), but 7 months' storage at 0°C. was sufficient to destroy almost completely the anthocyanin in strawberry and blackcurrant concentrates (see Fig. 1). The raspberry products were more stable and retained some anthocyanin under these conditions.

The relative differences between concentrates had been noted at intermediate periods of storage, for the raspberry concentrates retained from 60 to 70% of their anthocyanin after 3 months at 0°C. whereas the strawberry and blackcurrant products retained only 40% and 20% respectively. The losses of anthocyanin at 0°C. were masked to some extent by an increase in browning between the 3 and 7 months storage periods: this was greatest in the strawberry and blackcurrant concentrates.

Flavour changes were small in concentrates stored at deep-freeze temperature. Samples stored at 0°C. showed less change than might have been expected from the changes in appearance and in ascorbic acid content. They were little inferior to those stored at the lower temperature at the 3 months period and further deterioration was slight at 7 months.

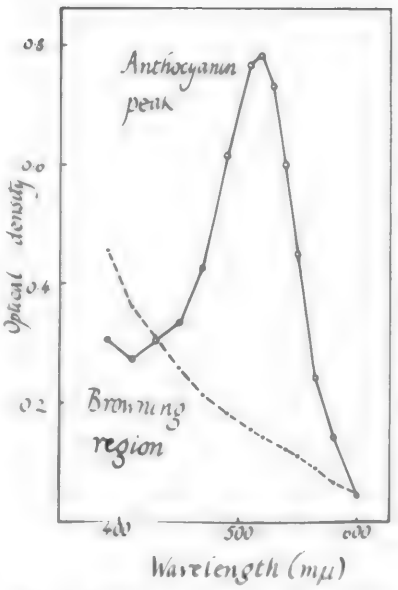

Fig. 1. Effect of storage temperature on colour of blackcurrant concentrate B/1.
.-----. 0-2°C.
o —o -23°C.

Discussion

The factors governing the stability of fruit juice products have been studied extensively in the last few years and the literature of the subject has been reviewed in recent publications.[1, 5, 7, 8] It is now apparent that in juices a complicated system of mutually interdependent reactions can take place between the components, their extent and nature being influenced by processing methods and by conditions of storage. The presence of ascorbic acid in juices, although conferring stability against some deteriorative changes, can at the same time itself lead to deterioration. This was shown by the work of Pederson and collaborators,[9, 10] who studied ascorbic acid and anthocyanin changes in berry juices and their findings have been extended by later work on pigment changes in juices and model systems.[5, 7, 8, 11]

Conditions that favour the oxidation of ascorbic acid, as for example the presence of air, high *p*H, high temperature and the presence of metal ions can encourage deteriorative changes. Its oxidation product—dehydro-ascorbic acid—can itself also apparently be concerned in pigment destruction.[5] The introduction during processing of metal ions such as copper that can catalyse oxidative changes will thus increase the instability of the product: trace amounts of metals are of course present in the juices naturally but their catalytic effects may be modified by complexing reactions with other juice components.

The nature of the carbohydrates may also influence the stability of juices, for their degradation products, produced by heat treatments, *p*H effects and the like may set in train secondary reactions with the other juice components. The effects of adding sugar to juice products have not always been conclusive and in the tests described the sweetened and unsweetened concentrates did not differ appreciably in their storage behaviour.

The stability of juice concentrates will vary according to the nature of the fruit. It was found for example that apple concentrates containing neither ascorbic acid nor anthocyanin remained acceptable under storage conditions where blackcurrant concentrates showed excessive deterioration.[3] In the tests described colour changes in raspberry concentrates were slower than they were in strawberry or blackcurrant products and it is probable that the higher ascorbic acid content of the last two hastened the destruction of pigment. The changes in flavour were less than the chemical changes studied but the latter point the way to the deterioration in flavour that eventually follows more prolonged storage. This was brought out in the earlier tests using higher storage temperatures.

Improvements in methods of juice concentration will serve little purpose if the products are stored under adverse conditions. The present tests have confirmed the value of storage at deep-freeze temperatures, where chemical changes are at a minimum, and it has the added advantage of restricting microbiological changes. The latter were not encountered in the products stored at 0°C. but chemical changes were considerable. In commercial practice, using larger bulks of material stored with more complete exclusion of air, deterioration may be slower. The use of intermediate temperatures, possibly with the addition of sulphur dioxide, may be found adequate for the retention of quality.

There seems to be at the moment a revival of interest in fruit juice products based on imported raw materials. If there is to be a comparable development in products derived from home-grown fruits, high quality must be a first consideration.

ACKNOWLEDGMENTS

Thanks are due to Mr. F. A. Roach of the National Agricultural Advisory Service for providing the raspberries used in the tests. Assistance in the experimental work was given by Mrs. M. R. Rodgers and Messrs. P. E. W. Rodgers and D. Sissons.

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Thermal Conductivity of Fruit Juices

By O. P. Kharbanda, M.Sc., D.Ch.E.

In determining the thermal conductivity of fruit juices, Riedel's data for apple juice, pear juice and grape juice are extremely useful, but the interpolation for temperature and concentration is both laborious and time-consuming. Here is a method for the rapid estimation of thermal conductivity in fruit juices at any temperature and concentration within a given range.

IN a series of careful determinations of thermal conductivity, Riedel[1] has reported experimental data for fruit juices at temperatures of 68°F. and 176°F. and solids content varying from 10-64 weight %. The entire data, after conversion to the usual engineering units, are presented in Table 1.

Table 1.—Thermal Conductivity of Fruit Juices

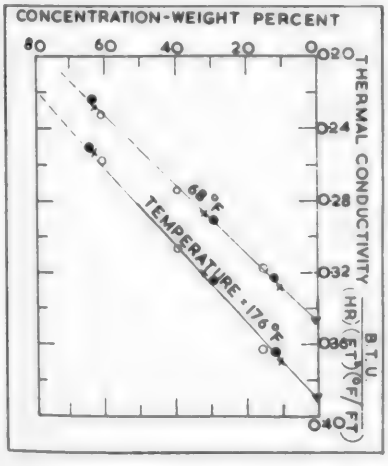
Name	*Symbol*	*Weight % solids*	*Thermal conductivity* (HR) (FT²) (°F FT) 68°F.	B.T.U. 176°F.
Apple juice	●	12·6	0·323	0·364
		20·8	0·291	0·325
		64·0	0·225	0·251
Pear juice	○	15·3	0·318	0·363
		39·6	0·274	0·307
		61·0	0·232	0·258
Grape juice	△	10·8	0·328	0·369
		32·0	0·287	0·320
		63·0	0·228	0·254

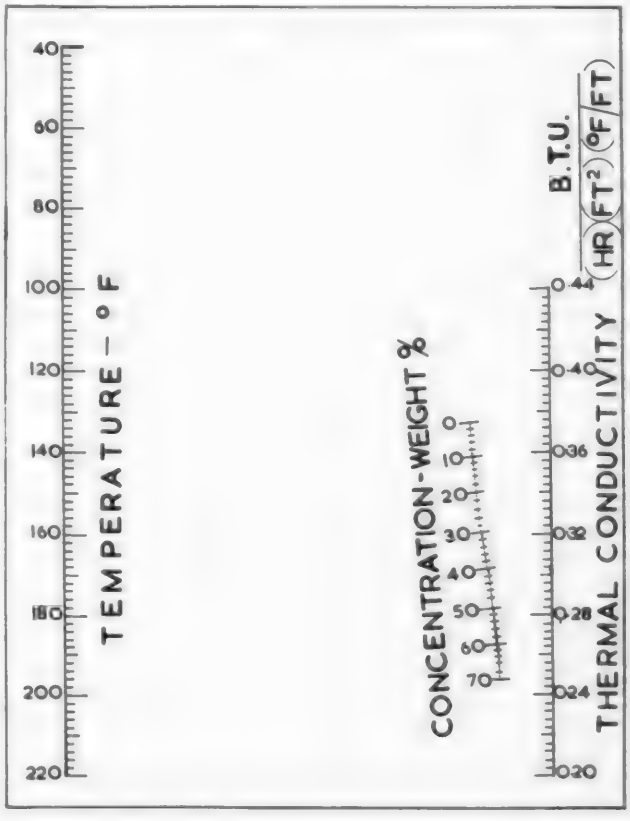
The data of Table 1 are extremely useful for heat transfer calculations relating to these solutions. However, the interpolation both with regard to temperature and concentration is laborious and time-consuming.

These data are plotted in Fig. 1. It will be noted that all the experimental points for the same temperature can be satisfactorily represented by a single straight line. This means that for a solution of a particular concentration at any one temperature, the thermal conductivity of the three fruit juices is identical.

The data, being known only at two temperatures, are not sufficient to establish a definite relationship between thermal conductivity and temperature. However, it is well known that for aqueous solutions, the variation of thermal conductivity with temperature is similar to that for water. This seems to apply for aqueous solutions of salt,[2] as well as sodium and potassium hydroxides.[3] It can be shown that, for the temperature range of interest, the thermal conductivity of water varies linearly with temperature.

The accompanying nomogram shows the variation of thermal conductivity of fruit juices as a function of temperature and concentration. It is based on the data from Fig. 1 and the assumed linear variation of thermal conductivity with temperature. This nomogram permits rapid estimation of thermal conductivity for these fruit juices at any temperature and concentration within the range





Right: **A nomogram for the rapid estimation of thermal conductivity of fruit juices. Its use requires only a single setting of a straight edge. The nomogram is based on data from Fig. 1, *left*.**

indicated. Its use requires only a single setting of a straight edge.

It has been noted[1] that the equation developed for the thermal conductivity of sugar solutions also applied to the case of fruit juices provided x, (weight % sugar) is taken to mean weight % solids. For this reason the values obtained from this nomogram are about the same as those from an earlier nomogram[4] for thermal conductivity of sugar solutions. The two, however, differ in constructional details and further the present one extends to higher concentration and temperature.

Example

Estimate the thermal conductivity of fruit juice (apple, pear or grape) containing 39·6% solids at a temperature of 176°F.

Connect 176 on the temperature scale with 39·6 on the concentration scale by means of a straight edge and read the thermal conductivity on the third scale as 0·308

$$\frac{\text{B.T.U.}}{(\text{HR})\ (\text{FT}^2)\ (^\circ\text{F}/\text{FT})}.$$

The actual experimental value, from Table 1, is 0·307

$$\frac{\text{B.T.U.}}{(\text{HR})\ (\text{FT}^2)\ (^\circ\text{F}/\text{FT})}.$$

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Fruit Concentrates

(*from page* 358)

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Biochemistry for the Food Technologist

This volume* should provide the basic practical biochemistry for those who have not actually graduated in the subject.

Although written primarily for the biochemist and medical student it nevertheless contains much interesting material about proteins, enzymes, carbohydrates and vitamins of direct interest to the food industries. A number of the 319 experiments described are capable of direct or modified application in the food laboratory and the contents seem reasonably up-to-date.

The four main parts of the book deal with the chemistry of cell constituents, digestive tract chemistry, analysis of blood and urine, and enzymes, vitamins and hormones, respectively. The first part is especially useful as it contains a lucid description of hydrogen ion activity and *p*H. It is refreshing to come across experiment 67 which describes the separation and identification of amino acids by paper chromatography. The R_f values of amino acids are listed for phenol and collidine/lutidine and, elementary though the treatment may be, it is sufficient to give one a start in a versatile technique which is rapidly becoming so useful to food science.

The second part can be omitted almost entirely except in so far as it will interest those who wish to learn of the history of food *after* mastication! The third part is likewise of little interest with the possible exception of the microchemical methods of sugar and protein analysis. However, about 80 pages are devoted to a complete treatment of the subject of manometric methods and this section should be of value to those studying the rôle of α-amino nitrogen in the browning reactions of foodstuffs in storage.

In part four we find the valuable subjects of enzymes and vitamins but a noteworthy omission from the former is phosphatase, a delicate test for which has recently been published by the B.F.M.I.R.A. to denote whether dead insects have passed through a cooking process. One might argue that enzymes have general features of similarity in any case but the importance of the phosphatases merits their inclusion in a practical book such as this.

Vitamin estimation

The estimation of vitamins by colorimetric and fluorimetric methods is perhaps of greatest interest to the food chemist. Ascorbic acid determinations are dealt with by the 2,6-dichlorophenol indophenol and 2,4-dinitro-phenylhydrazine methods, the latter being of particular interest. Colorimetric methods are described for the estimation of choline, nicotinic acid, pyridoxine, thiamine and the tocopherols. A modified Carr-Price antimony trichloride test for vitamin A could be supplemented or superseded by techniques recently published as much work has been carried out in this field on the vitaminisation of margarine.

The same remarks apply to the method listed for vitamins D_2 and D_3. Riboflavin and again thiamine are given fluorimetric methods of analysis.

There is a good chapter on microbiological methods of estimating vitamins and amino acids.

The book is completed by an appendix containing general laboratory instructions in which the composition of all necessary reagents and media is given and which also gives details for the operation of the usual laboratory apparatus. This type of information is often lacking in books of this kind and its inclusion is most welcome.

The book can be recommended to food technologists and food chemists who wish to place their biochemistry on a firm practical basis and who, furthermore, wish to adapt methods of precision to items in their own spheres of interest.

J. D. DEVEY.

* *Practical Methods in Biochemistry*. By F. C. Koch and M. E. Hanke. 6th Ed. Baillière, Tindall and Cox. Pp. 537. 38s. 6d. net.

The Chemistry of Peanut Butter Production–2

By A. F. Freeman, N. J. Morris, and R. K. Willich

(Southern Regional Research Laboratory of the Southern Utilisation Research Branch, Agricultural Research Service, U.S. Department of Agriculture)

The first part of this article, which was published in the May issue, dealt with the processing and properties of peanut butter. This part covers palatability and preparation of peanut butter, methods of analysis, fortification with vitamin A, effect of processing temperatures and storage. The article is an abridged version of a recently published report on research carried out by the authors on the chemistry involved in the production and use of peanut butter.

Palatability

THE palatability of peanut butter, as of any food, is the ultimate basis of acceptance. While objective measurements of quality characteristics may strongly indicate quality in a product, in the final analysis flavour largely determines the acceptability. Peanut butters prepared in the pilot plant from No. 1 grade, white Spanish peanuts, roasted to various extents, were evaluated[37] periodically by an organoleptic panel throughout a period of storage of two years at 80°F. In general (table 6) the panel considered the colours of peanut butters from "light" roasted peanuts to be *fair* whereas it considered the colours of peanut butters from "heavy" roasted peanuts to be *good*.

The panel found little difference in stickiness (table 6) of peanut butters in the mouth, regardless of the extent of roasting accorded the peanuts, and described all samples as *moderately sticky*. The judgment of the panel regarding spreadability of the samples was *good* or *excellent*, the tendency being for the peanut butters made from the lighter roasted peanuts to receive the *excellent* ratings.

The ratings assigned by the panel for the presence or absence of rancidity in peanut butters at the time of preparation and throughout a period of storage of two years at 80°F. indicated that rancidity was not detected organoleptically throughout the two years the investigation was in progress. This finding is supported by chemical determination of the stabilities of the oils of these peanut butters. The stability of these oils towards autoxidative rancidity was found[23] to be quite high at the time of manufacture, and to remain satisfactorily high (although somewhat reduced) even after storage of the peanut butters at 80°F. in the absence of light for two years.[38] Furthermore, the free

Table 6. Properties of Peanut Butters made from Variously Roasted Peanuts

Batch[1]	Processing information		Colour of Peanut Butter		Panel evaluation		
	Roasting time	Roasting temp.			Texture		Colour
		Minimum	Maximum	Extent of roast[2]	x-Trichromatic co-ordinates[1]	Stickiness	Spreadability	
	min.	°F.	°F.					
1	17	230	275	light	0·3634	—	—	—
3	21	205	285	,,	0·3824	moderate	excellent	fair
6	25	200	292	,,	0·3873	,,	,,	,,
2	23	205	283	heavy	0·3914	,,	,,	,,
4	22	200	285	,,	0·3916	,,	,,	,,
5	21½	205	285	,,	0·3958	,,	,,	good
9	26	200	298	,,	0·3987	,,	good	,,
7	22½	200	290	,,	0·4051	,,	,,	,,
11	23	215	295	,,	0·4052	,,	,,	,,
14	29	200	304	,,	0·4135	,,	,,	,,
12	26	200	308	,,	0·4149	,,	,,	,,
15	24	210	300	,,	0·4154	,,	,,	,,
10	24	200	300	,,	0·4162	,,	,,	,,
13	25	205	300	,,	0·4164	,,	,,	,,
8	21	210	290	,,	0·4168	,,	excellent	,,
16	25	205	305	,,	0·4215	,,	good	,,
17	20	240	305	,,	0·4257	,,	excellent	,,
18	21	215	315	,,	0·4299	,,	good	,,
19	17¾	250	320	,,	0·4374	,,	,,	,,
S-1[3]	—	—	—	—	—	moderate	good	fair
S-2	—	—	—	—	—	,,	excellent	,,
S-3	32	195	302	heavy	—	,,	good	good

[1] Batches are arranged in ascending order according to extent of roast from the lightest to the heaviest as indicated by their *x*-trichromatic co-ordinates.

[2] "Light" means that the colour was not darker than Plate 11, G-6 of Maers and Paul's "Dictionary of Color" and "heavy" means that the colour was darker than Plate 11, G-6.

[3] Standard samples S-1 and S-2 were fresh commercial peanut butters and standard S-3 was an experimental peanut butter less than 6 months old.

fatty acid contents of the oils of the experimental peanut butters, for which organoleptic data are given, were uniformly low (*ca.* 0·2%) at the time of manufacture.[11] It has also been found that the free fatty acid contents of the oils did not change appreciably during the storage of the peanut butters throughout the period of storage of two years, whereas some reduction in stability of the oils was observed.

There was high acceptance of the peanut butters near the middle of the list of batches (table 7), even after storage for more than a year. This seemed to indicate that these samples retained desirable flavour longer than the samples made from peanuts of lighter or heavier roasts.

Results obtained upon further evaluation of samples from 10 batches of the peanut butters are shown in table 8. The balanced incomplete block design[39] was used in each of the three experiments. The statistical analysis was that outlined for the particular design used.

The three peanut butters (batches 10, 12 and 14) which consistently received the highest scores (tables 7 and 8), when evaluated throughout the 24 months of storage, were very close together in their *x*-trichromatic coordinates. The *x*-trichromatic coordinates, which constitute objective indices of the extent of roasting, were (table 6) 0·4162, 0·4149, and 0·4135 for batches 10, 12 and 14, respectively.

It may be concluded from organoleptic data obtained on stored peanut butters prepared from variously roasted peanuts that the peanut butters from medium roasted peanuts were considered by the panel to embody the most desirable flavour throughout the period of 24 months the organoleptic evaluation was in progress. It does not necessarily follow that large consumer panels would prefer exactly the same roast. These data indicate that careful control of roasting of peanuts is necessary for the production of peanut butter of the most desirable flavour and good flavour retention.

Table 7. Palatability Ratings[1] for Peanut Butters

Batch	Extent of roast	Appraisal after storage at 80°F., months: 0	1-6	7-12	13-18	19-24
3	light	—	—	good —	unsatisfactory	—
6	light	good +	good +	good —	unsatisfactory	unsatisfactory
4	heavy	—	—	good —	unsatisfactory	—
5	heavy	—	—	—	good —	unsatisfactory
9	heavy	excellent —	good	good +	unsatisfactory	fair
11	heavy	—	—	—	good —	good —
14	heavy	good +	—	good	good —	good —
12	heavy	excellent —	excellent —	good +	good —	good —
15	heavy	—	—	good	fair +	good —
10	heavy	good +	excellent —	good +	good —	good —
13	heavy	—	good	—	good —	good —
16	heavy	—	good —	good +	fair +	fair +
17	heavy	—	—	good —	fair +	unsatisfactory
18	heavy	—	—	—	good —	unsatisfactory
19	heavy	—	—	—	—	unsatisfactory

[1] These appraisals are the means of several replicates rated adjectively by a panel of 11 persons, except for the ratings before storage which are the means of two replicates by 6 persons. These adjectives had been assigned numerical values: A rating of perfect denoted a score of 10; excellent, 9; good, 8; fair, 7; and less than fair, 3. In the above table, *e.g.*, good + denotes that the mean lay between 8·1 and 8·4, and good — denotes that the mean lay between 7·5 and 7·9.

Table 8. Mean Palatability Scores[1] for Peanut Butters

Batch	Extent of roast	Experiment 1: Storage at 80°F., 14-24 months	Experiment 2: Storage at 80°F., 18-24 months	Experiment 3: Storage at 80°F., 21-26 months
0 ..	light	6·4	6·8	6·7
9 ..	heavy	6·8	7·2	6·9
11 ..	heavy	7·7	—	—
14 ..	heavy	8·0	7·9	7·3
12 ..	heavy	7·8	8·0	7·5
15 ..	heavy	7·8	—	—
10 ..	heavy	7·8	7·6	7·8
13 ..	heavy	7·9	7·3	—
16 ..	heavy	7·5	7·4	7·5
17 ..	heavy	6·9	—	—
S-1[2] ..	—	—	7·0	7·4
S-2[2] ..	—	—	7·3	—
S-3[2] ..	—	—	7·1	—
L.S.D.[3] ..	at 5% level	0·6	0·8	0·8
L.S.D. ..	at 1% level	0·8	1·0	1·1

[1] For experiments 1 and 2 the scores are the means of six replicates scored by eleven judges; for experiment 3 the scores are the mean of ten replicates scored by eleven judges. A score of 10 denotes perfect; 9, excellent; 8, good; 7, fair; 3, unsatisfactory.

[2] Standards S-1 and S-2 were fresh, commercial peanut butters which the panel rated of "fair" colour; standard S-3 was an experimental peanut butter (less than six months old) which the panel rated of "good" colour.

[3] L.S.D. indicates the least difference between scores which is significant at the stated level of probability.

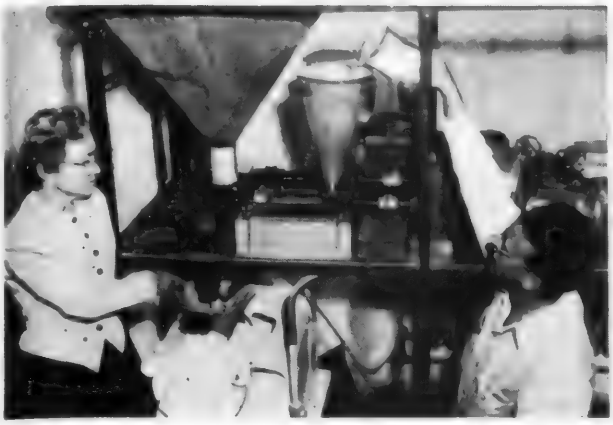
Table 9. Vitamin A[1] Content of Fortified Peanut Butters during Storage

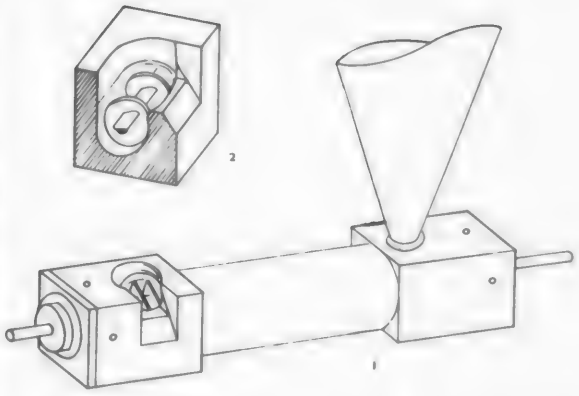
Days	Time and Temperature of Storage: 80°F. Without antioxidants	80°F. With antioxidants[2]	100°F. Without antioxidants	100°F. With antioxidants[2]
	U.S.P. units/gram			
0[3]	76	79	76	79
65	68½	74	75	75½
123	72	74	74	77½
180	67	73½	72	75½

[1] Synthetic vitamin A palmitate; values expressed are averages of duplicate analyses of duplicate samples.

[2] Contains 0·005% nordihydroguaiaretic acid and 0·0025% citric acid (anhydrous basis).

[3] Freshly prepared peanut butter.





Left: **Fig. 9. Special feeders designed to obtain a product of reasonably definite and uniform composition. All of the materials were discharged simultaneously from the feeders directly on to the screw feeder of the peanut butter grinder.**
Right: **Fig. 10. Feeder for salt or granulated hard fat. (1) Feeder; (2) Cross section of discharge end of feeder.**

Incorporation of vitamin A

The incorporation of vitamin A in peanut butter would be desirable from a nutritional standpoint, because peanut butter as a spread supplements butter or margarine, both of which contain substantial quantities of vitamin A. Vitamin A is not added to peanut butter as a nutritional supplement as is the case with other foods, such as margarine, although peanuts, the principal ingredients of peanut butter, contain practically no vitamin A.[40] Inasmuch as vitamin A is essential for normal growth and maintenance of high visual acuity, resistance to fatigue and proper healing of wounds and fractures, the Armed Forces desire a stable field ration which has been fortified with vitamin A. Peanut butter was considered suitable for this purpose because of its popularity and its general properties[14] and excellent resistance to oxidative deterioration.[23]

While some information about the properties of experimental batches of peanut butter fortified with vitamin A has appeared in the literature, no information has been published about the technology of incorporating vitamin A in peanut butter.

Feeding equipment

In the continuous manufacture of peanut butter careful control of feeding mechanisms which govern the ultimate composition of the finished product is essential from the standpoints of uniformity of composition and quality of the product.

No suitable device for the incorporation of vitamin A in peanut butter was included with the conventional equipment comprising the laboratory pilot plant. Also, variation in rates of delivery of peanuts and essential additives was observed when the usual feeding mechanisms were used. Accordingly, it was necessary to replace existing equipment in order to obtain a product of reasonably definite and uniform composition. Hence, four mechanical feeders were installed as adjuncts to a conventional peanut butter grinder. Three of the feeders used for delivering the peanuts, salt, and granulated hydrogenated peanut oil to the grinder were designed at the Southern Regional Research Laboratory and were constructed locally. These feeders were mounted (Fig. 9) on a platform erected over the peanut butter grinder. The fourth feeder was a standard item and was used to deliver to the grinder synthetic vitamin A palmitate dissolved in peanut oil. Each of the four feeders was linked to a variable speed drive so that the delivery rate of each material could be adjusted. The materials supplied to each of the feeders were contained in hoppers of appropriate size[41] mounted (Figs. 10 and 11) directly over the intakes of the feeders. All of the materials were discharged simultaneously from the feeders directly on to the screw feeder of the peanut butter grinder, thus providing some mixing of the materials before they were ground into peanut butter.

The two small feeders were identical with each other in size and design, and were used to deliver salt and granulated hard fat. By discharging the salt or the granulated hard fat from the top side (Fig. 10) of the feeder, variations observed during low rates of delivery when discharging the material from the bottom of the feeder were eliminated.

A *Zenith* gear-type pump (Fig. 11), consisting simply of a centre plate and two counter-rotating gears which displace liquids at a rate proportional to the speed of the gears, was used to deliver vitamin A palmitate dissolved in peanut oil. A reservoir to hold the solution was used to supply the pump. A small stirring motor was mounted directly over the reservoir for the purpose of keeping citric acid in suspension. The discharge of the pump was connected by tubing to a nozzle directed downward toward the screw feeder of the peanut butter grinder.

Materials

Since the uniformity of delivery by volumetric displacement is dependent upon uniformity of particle size, it was necessary in the cases of salt and hydrogenated peanut oil to prepare these ma-

terials so that their particle sizes would be nearly uniform. Accordingly, commercial "flour" ground salt was sieved using U.S. Standard sieves. The commercial, flaked hydrogenated peanut oil was first chilled, and then passed through a No. 1 *Wiley* mill equipped with a 2 mm. screen. To prevent clogging of the screen after prolonged use small quantities of dry ice were ground along with the hard fat. The granulated material was sieved, using U.S. standard sieves. Delivery of roasted peanuts was determined with split-blanched peanuts as customarily prepared for the manufacture of peanut butter.[41]

Uniformity of feeding

Delivery measurements which were determined[41] independently on each feeder, indicated a high degree in uniformity of delivery. Furthermore, no significant change in rate of delivery was found upon reduction of the "head" or supply of material contained in the hoppers. Measurements of rate of delivery were obtained on each material under conditions of delivery calculated to produce about 4·1 lb./min. of a peanut butter composed of 95·5% roasted peanuts, 2% hard fat, 1·5% salt, and 1% peanut oil as a carrier for vitamin A.

Fig. 11. Equipment for the delivery of peanut oil as a carrier for vitamin A. The operator's hand is on the variable speed drive and next to it (*bottom right*) is a gear type pump. The cone-shaped device is the oil reservoir.

Preparation of peanut butter

Three batches of peanut butter containing vitamin A, salt and hard fat were prepared from runner peanuts by a process similar to that generally used in industry. Synthetic vitamin A palmitate dissolved in a peanut oil was delivered with the other ingredients at the rate of 84 U.S.P. units g. (computed) of the fortified product, taking into account all ingredients. Nordihydroguaiaretic acid (NDGA) and citric acid, added for the protection of the vitamin A, were incorporated during the preparation of a portion of the batch of fortified peanut butter intended for storage.

Methods of analysis

The vitamin A contents of the fortified peanut butters were determined by a modification of the U.S.P. Spectrophotometric method.[42] Stabilities of oils extracted from the fortified peanut butters were determined by the active oxygen method[18,19,22,20] at 97.8°C.

Uniformity of addition of vitamin A

Vitamin A contents were determined on a series of fortified peanut butter samples taken at regular intervals after constant operating conditions had been reached. The temperature of the peanut butter issuing from the grinder was recorded continuously (Fig. 12). The temperature recorded after grinding had been in progress for 10 min. was 138°F. and after grinding had been in progress for 40 min. was 144°F. Data obtained in preliminary work showed that within the first 10-15 min. of grinding considerable variation in vitamin A content occurred coincident with the usual rapid rise in the temperature of the issuing peanut butter. Data (Fig. 12) indicate that the vitamin A contents of the fortified peanut butter ranged from 74 to 83 U.S.P. units/g. The average of the vitamin A contents for the series of samples (78 U.S.P. units/g.) was found to be 7% less than the amount computed to have been incorporated during manufacture.

Effect of processing temperatures

For determining the effect of processing temperature, the fortified peanut butter issuing from the

grinder was mixed in a Case homogeniser equipped with a heat exchanger in order to simulate the range of processing temperatures general in industrial practice and to produce peanut butters having temperatures of approximately 140°, 160°, and 180°F., respectively.

Analyses of samples of these fortified peanut butters indicated[13] that the loss in vitamin A content occasioned by processing at 180°F. was only slightly greater than that occasioned by processing at 160°F., or 140°F. The content of vitamin A in the peanut butters processed at 160°F. and 140°F. was found to be 80 U.S.P. units/g., a decrease of 4 U.S.P. units/g. or 5% on the basis of the amount of vitamin A computed to have been incorporated. Correspondingly, the content of vitamin A in the peanut butter processed at 180°F. was found to be 78 U.S.P. units/g., a decrease of 6 U.S.P. units/g. or 7% on the basis of the vitamin A incorporated in the product.

These findings and general knowledge concerning the properties of vitamin A support the conclusion that losses in vitamin A content may be ascribed to frictional heat and inclusion of atmospheric oxygen in the peanut butter during grinding.

Effect of storage

Peanut butter fortified with vitamin A was packed in glass jars (completely filled and closed with lined screw caps) and stored in the dark at 80° and 100°F. to determine the effect of storage on the content of vitamin A. Some of the samples contained 0·005% NDGA as an antioxidant and 0·0025% citric acid as a synergist for the protection of the vitamin A.

The fortified peanut butter was found to retain most of its original vitamin A content after storage for six months at both 80° and 100°F.

Analyses of samples made every two months over the period of storage showed (table 9) generally that the vitamin A contents were still within the range resulting after manufacture (74-83 U.S.P. units/g.). In all cases, regardless of temperatures or periods of storage investigated, the vitamin A content per 1-½ oz. of peanut butter was found to be more than sufficient to supply one-half the daily recommended amount for an adult (2,500 U.S.P. units).

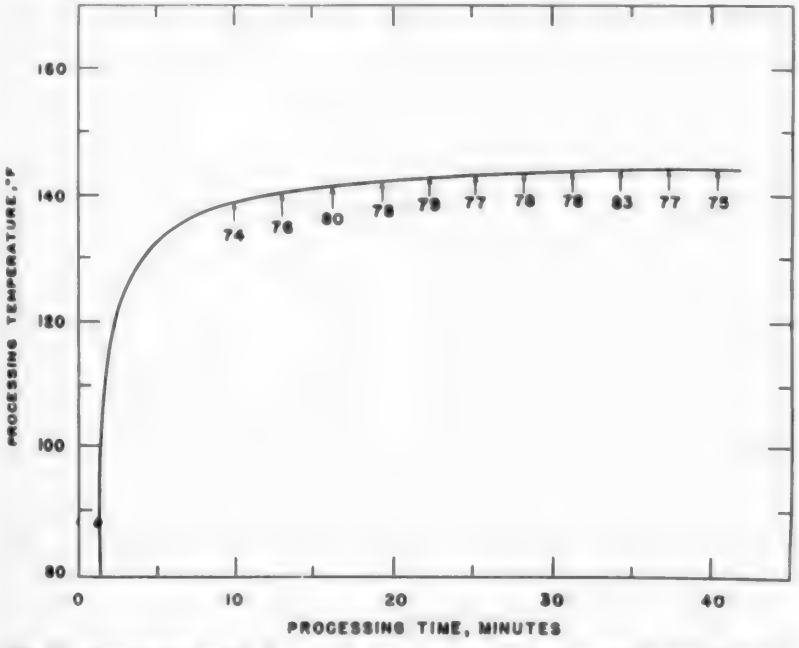


Fig. 12. Range of vitamin A content after establishment of constant operating conditions. Figures under arrows refer to U.S.P. units of vitamin A per g. of peanut butter.

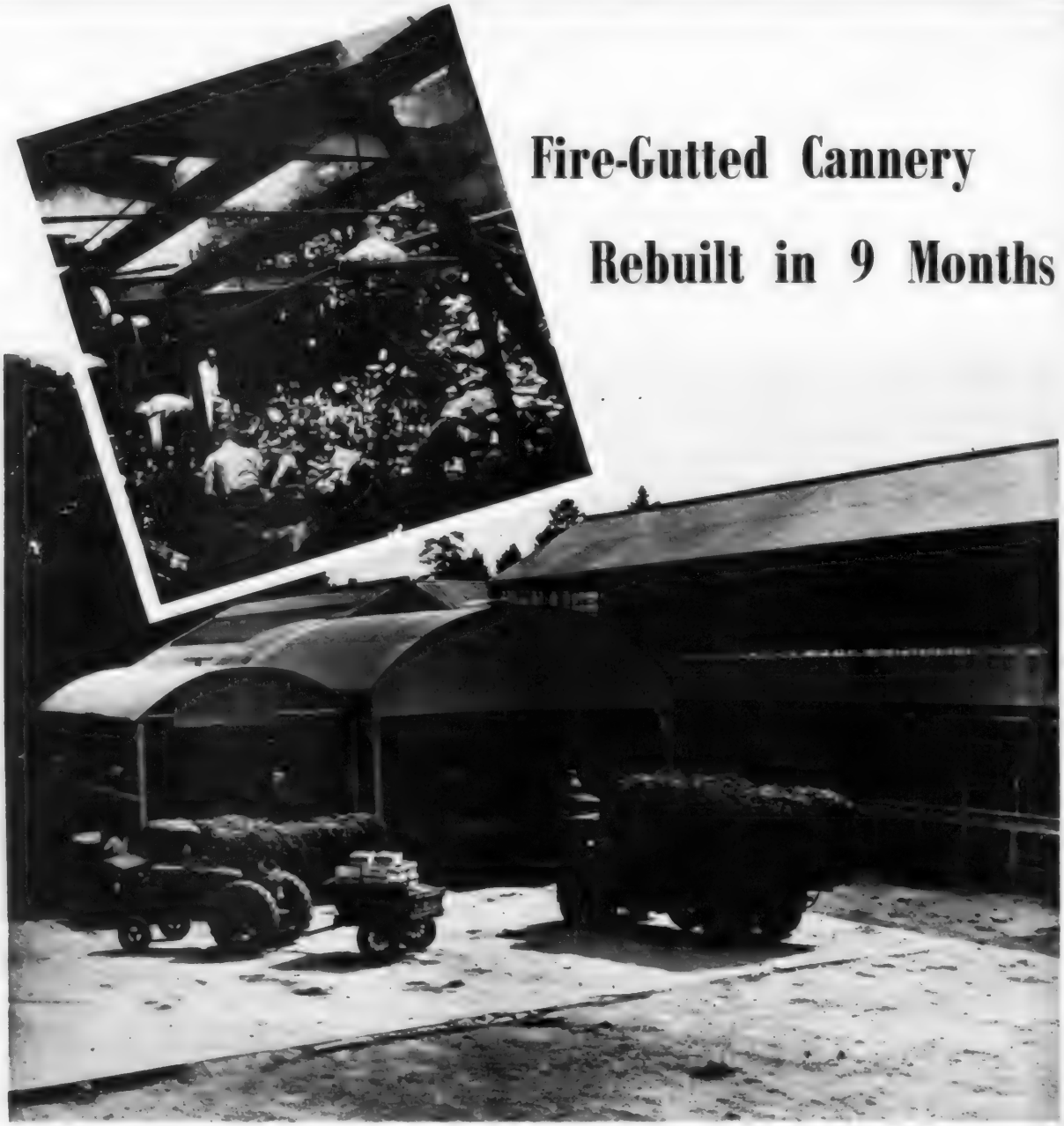
While the results indicate that the vitamin A contents were slightly higher in those samples containing antioxidant and synergist than in the control samples, no strong evidence was obtained of any appreciable benefit from use of these substances. The further observation, that there was little difference between the AOM stabilities of the oils of these peanut butters determined at the same times as the vitamin A contents, supports the conclusion that little advantage was obtained from adding the antioxidant and synergist.

Effect of grinding on particle size

Because the extent of grinding affects the amount of oil freed from the peanut and hence the consistency and the separation of oil of peanut butter, efforts were made to determine the particle size distribution of the oil-free meal of peanut butters ground variously. Dry sieving of the oil-free meal from the product was unsuccessful because of the appreciable electrostatic charge produced on the particles during sieving. However, it was found possible to sieve the product satisfactorily by pouring a slurry of peanut butter and commercial hexane (b.p. *ca.* 60°C.) on the sieve. In this procedure a slurry of 5 g. of the peanut butter and 100 ml. of the solvent was prepared for each sieve in the U.S. Standard series from No. 20 to No. 400. The slurry was poured on the sieve, and the percentage of oil-free meal (dry-weight basis) remaining on the sieve was determined. Only about 5-13% of the meal (dry weight, oil-free basis) was retained in the No. 400 sieve, from which it follows that while the majority of the solid material comprising peanut butter is exceedingly fine, considerable variation in texture results from the amounts of relatively coarse particles produced by the different grinders. Particles retained on the sieves were nearly ovoid in shape with small, jagged protuberances, the general shape or contour being similar regardless of particle size.

(*Turn to page* 379)

Fire-Gutted Cannery Rebuilt in 9 Months



The "before and after" photos above show the scene after the fire which destroyed the cannery, and the rear of the new buildings with lorries piled high with pea vines awaiting unloading. The vines are being forked into a viner which threshes the peas from the vines and delivers them shelled to the production lines.

THE FIRE which broke out at Smedley's Blairgowrie cannery on August 5 last year reduced the buildings and plant to smouldering ruins. The scene on the day of the fire is shown in the inset photograph above. Firemen and salvage workers toil after the blaze which destroyed 5 million cans, hundreds of thousands of cartons and nearly all the valuable machinery.

Smedley's answer to this disaster was an energetic rebuilding programme which has been carried through in the record time of nine months, enabling the cannery to be ready for the 1955 season.

It was officially opened on July 26 by the Minister of State for Scotland, Lord Strathclyde, who afterwards toured the factory with the chairman of the company, Mr. W. V. Smedley, and other directors.

In opening the factory, Lord Strathclyde said: "I am very glad indeed to see enterprises such as this growing up in our country towns throughout Scotland. They are diverting themselves for the exploitation of the natural wealth of the country, they are creating a more proper balance between agriculture and industry, and also providing employment for people in very satisfactory and pleasant surroundings."

The new building

The overall superficial area of the ground floor is 29,000 sq. ft., with a first-floor can-loft of 9,000 sq. ft. The building has a steel

On August 5, 1954, Smedley's Blairgowrie cannery in Perthshire was destroyed by fire, the main production bay being almost completely gutted. Less than a year later, on July 26, the rebuilt cannery was officially opened by the Minister of State for Scotland. The rebuilding, carried out in the record time of nine months at a cost of £125,000, has given Smedley's one of the most modern canneries in the world. It has five parallel production lines for canning and quick-freezing peas and soft fruits.

frame with asbestos cement sheeting and continuous glass fenestration. There is about 8,500 sq. ft. of glass in its walls. Special attention has been paid to the floor surfaces and underfoot conditions by the provision of ribbed tiling. The trolley runways are in Granolithic.

Walls and boxed stanchions have been given a cement enamel finish, while the underside of the asbestos sheeting, together with the concrete floors, have been sprayed with limpet asbestos for protection against steam and moisture.

At the peak of the season about 400 workers are employed, 100 of them students on vacation. These are housed alongside the factory in special brick-built dormitories equipped with ironing boards, showers, electric irons and laundry sinks.

In the centre of the production floor is an elevated works manager's office and quality control laboratory.

The pick of the pea crop goes into the cold store to await freezing. Inside the freezing tunnels it is 40° below zero, hence the heavy protective clothing.

Full steam ahead on the last stage of the pea line. The cans are tracked down from the loft above to be filled and sealed. This photograph catches something of the furious tempo characteristic of the factory at the height of the season.

The main production bay houses five parallel production lines. These are the canning and quick-freezing pea lines; two fruit canning lines and a quick-freeze fruit line.

Pea canning line

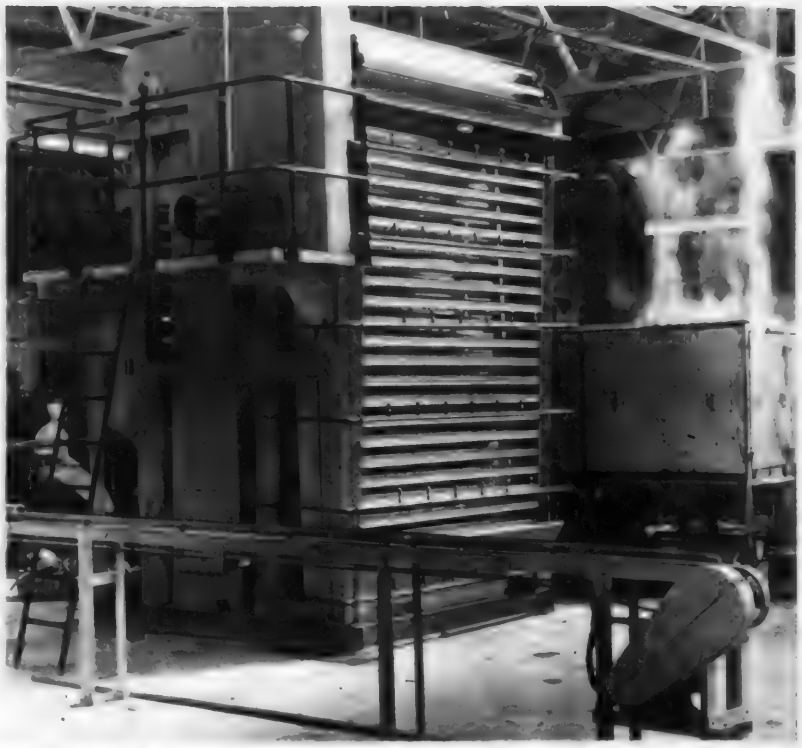
The pea canning line begins outside the factory. Two viners are sited outside the production bay to handle loads not vined in the fields. The vines are belt-fed into a revolving six-sided punctured rubber screen, and beaten by threshing blades attached to a revolving drum. On the superviner, both the speed of the drum and the angle of the blades are variable and can be adjusted to give maximum output as conditioned by the quality and condition of the load.

The threshed peas are discharged through the rubber screen upon a canted metal apron moving in opposition to the line of

descent, and fall on to a conveyor feeding bucket elevators to 11 one-ton hoppers. The haulm is carried through and ejected by waste elevator.

Gates on the underside of the hoppers allow the peas to fall on bucket elevators to the first of the cleaning machines. This is a four-stage dry cleaner of Smedley's own design and manufacture. A suction pump removes fragments of pod and leaf into either a waste bag or a rotating rod and worm conveying the dead material to a waste shoot. The peas pass through a riddle on to a shallow boat decked with a canted vibrating screen which engages more fragments while the peas roll on to a bucket elevator. As they are about to fall, a second suction device removes any remaining fragments.

The peas are elevated into one of three automatic weighing machines, measured into one-cwt. quantities, and dropped on to the first of the washing machines—a flotation washer. Here, jets of water force the peas into a bath while any small quantity of mud and stones is carried down a waste shoot. While the peas sink to the bottom of the bath, light extraneous matter is carried on the surface and is skimmed into a waste trough. From the bath, the peas are flumed to a canted, vibrating screen and washed by parallel lines of sprays. As the peas roll down, they are gathered by bucket elevator, and emptied into overhead conveyor troughs. They are flumed to one of three holding tanks before being elevated to a grader. Two revolving riddles sift the peas into three size categories and eject them into separate holding tanks. Bucket elevators convey the peas as required to a Dodman blancher for partial cooking and the decomposition of enzymes. The peas are flushed through a Dodman rod washer—a revolving rod drum that sieves fragments of peas from the main stream and washes off the blanching water—and roll into bucket elevators which convey them to recleaners similar to the dry cleaners used earlier.



This hydrostatic fruit steriliser is one of the many modern machines which help to streamline production at the rebuilt cannery. Inside it, the fruit is sterilised and cooled; and the cans emerge at the rate of 160 a min. ready for casing at the end of the line.

From them they are discharged on to rubber-belted inspection tables where observers search for stained or damaged peas which have escaped the mechanical detection earlier in the line. At the end of the tables the peas are funnelled into bins and manhandled into hoppers feeding a bucket elevator to the pea filling machines. The three 10-head pea-fillers fill the cans with peas and a covering liquid (which includes salt and sugar) at the rate of 180 a min., pushing them into a clincher and double-seamer. Sealed cans are discharged from the seamers into cages submerged in heated brine water to cushion the impact of fall. The cans are necessarily scrambled, but this ensures a more even sterilisation in the retorts.

Mechanical hoists are used for loading and unloading into retorts. After sterilising the cages are hooked to a powered monorail conveyor, and trailed through a 100-ft.-long tank trenched outside the factory alongside the main production bay. They are in the tank for approximately 20 mins., emerging at a temperature of 105°F. The cages continue on the monorail to the packing bay where the cans are handpacked into cartons and stored.

From its twin freezing tunnels, the factory can produce more than 20 tons of quick-frozen food a day. For peas the process is broadly the same as for canning (except that only the tenderest peas are used) until leaving the blancher and rod washer when they are cooled, recleaned and passed through a quality grader. Here, the peas submerge themselves at various levels in a brine solution, the youngest ones floating on or just under the surface. These are skimmed off and alone are allowed to go on to the inspection tables. The remainder are returned for canning.

From the tables, bowls of peas are gathered and taken to a dewatering reel which rids them of surplus moisture before they are tipped by elevator on to trays and

taken to the pre-cooling room for chilling at 32°F. Later they are taken to the freezing tunnels where a 120,000 ft. an hour draught blows on them for 1½ hr. at a temperature of 40° below zero.

They are all bulk-frozen and, after being broken up, are elevated to a carton filler from which the cartons are chain-conveyed to a carton closer (of Smedley's own design) and then to a wrapper that covers the cartons with a wrapping of transparent film. The cartons are then transported to the cold storage rooms to remain at a temperature of 0°F. until distributed.

Raspberries and strawberries (the factory's "specialist lines") are also frozen. On this line they are graded, hand-filled into cartons, filled with syrup, and then taken to the freezing tunnels.

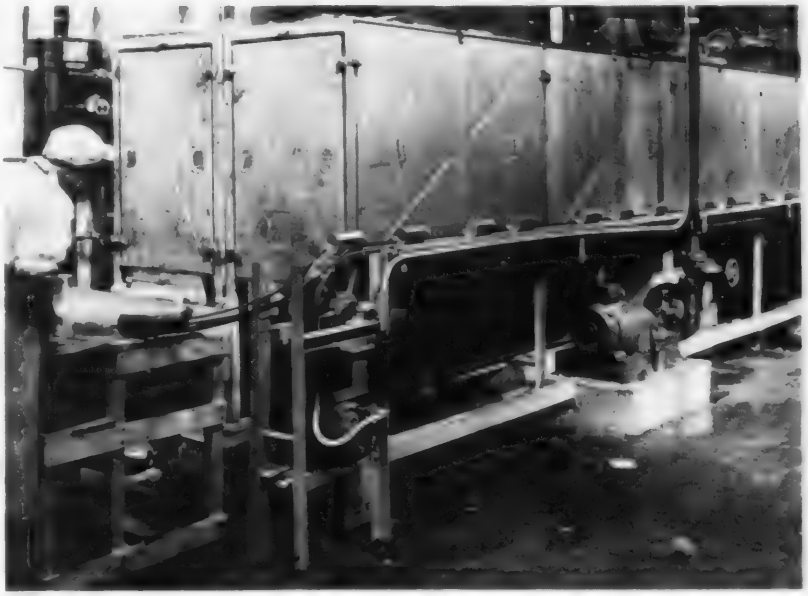
Processing on the strawberry and raspberry canning lines follows roughly similar patterns. The fruits are hand-filled into cans and then tracked automatically to the syruper. Here a prescribed quantity of syrup is shot into each can through fine jets before the lids are clinched in place. Conveyor belts transport the cans into an exhaust box that partly pre-cooks the fruit and finally kills any bacteriological content before the seamer seals the lids. Still automatically conveyed, the fruit is finally sterilised in a non-agitating fruit steriliser or a hydrostatic fruit steriliser. The non-agitating steriliser, built specially for Smedley's, sterilises and cools the cans and has a variable output of 85-200 cans per min.

The hydrostatic steriliser has a similarly variable range. The cans (it can handle three different sizes at the same time) sit in hooked H-shaped slats which convey the fruit down into a sterilising chamber. The heat remains constant while the level of water determines the degree of sterilisation. The slats draw the cans up and out of the chamber to be cooled. The cans are sprayed with cold water (re-circulated from a reservoir pit beneath the machine) as the slats carry them down on the other side of the sterilising chamber, and up and down again before they are finally passed through the reservoir beneath the machine, and discharged on to a conveyor belt to the packing bay.

Cans filled with strawberries filing out of the syruper ready to have their lids clinched in place.

SOME SUPPLIERS OF EQUIPMENT

Fruit sterilisers: *Mitchell-Webster; Mather and Platt, Ltd.*
Seaming equipment: *Metal Box Co., Ltd.*
Freezing compressors: *J. and J. Weir, Ltd.*
V-belt drives and motors: *J. H. Fenner, Ltd.*
Air controllers: *Cambridge Instrument Co., Ltd.*
Blancher and rod washer: *Alfred Dodman and Co., Ltd.*
Pea filling machines: *Robert Kellie and Sons, Ltd.*
Carton filler: *Mather and Platt, Ltd.*
Carton wrapping machines: *Forgrove Machinery Co., Ltd.*
Can elevator: *Metal Box Co., Ltd.*
Pyrex piping: *QVF, Ltd.*



The end of the fruit canning line. At high speed cans of raspberries are ejected from the non-agitating fruit steriliser into the hands of packers. Little more than an hour before the fruit was still growing in the fields.

Lecithin in the Bakery

By James Stewart, F.I.B.B.

For several years lecithin has been used with success in such food industries as chocolate manufacture, margarine making, and baking. Here the author discusses its use for bakery products and gives recipes for fancy breads, pastries, buns and cakes incorporating lecithin.

COMMERCIAL lecithin is obtained from vegetable oils. It is brown to light brown in colour, depending on whether it is bleached or unbleached. When properly refined it is practically odourless and has a bland taste. Over the past 20 years lecithin has been accepted as an ingredient in the food industries especially in chocolate manufacture, margarine-making, biscuit-making, bread-making and flour confectionery.

When used in foodstuffs, lecithin is an edible, wholesome, natural product unlike synthetic compounds which may act in a similar manner, but whose physiological effects may be unknown. Lecithin is a natural bread improver of the greatest practical value in modern bread-making technique. When it is used as an emulsion in doughs it will surround and lubricate the protein molecules of flour, giving the gluten increased elasticity and swelling capacity.

Lecithin affects the dough immediately during dough making. It increases the resiliency of the doughs so that they stand up to severe mechanical treatment extremely well. The doughs go clean and easily through the dividers, hander up and moulding machines without trouble or any sign of strain.

Using lecithin the dough is initially softer in consistency, but on fermenting gives at the moulding stage a dough of improved stability and better oven spring. There is no felling effect of machine moulding. For machine bakeries lecithin is an indispensable help in producing good breads. There is a better fermentation tolerance so that fuller proof and increased volume under normal conditions can be obtained. There is good "over-spring" during baking. The baked bread has the typical appearance of enriched milk or fat bread. The crumb is soft, bright and light in colour with a velvet-like feel and distinctly good flavour. The texture is usually excellent. Crusts of bread have a more attractive colour and greater tenderness. Bread made with lecithin eats, keeps and cuts better, its crumb being even and moist. Lecithin counteracts staling. Baking and fermentation loss is lower and the yield of every batch should be higher.

Tables 1 and 2 summarise the effect of lecithin in the making of bread, and on the finished products.

How to use lecithin in baking

Commercial lecithin can be used either as an emulsion or as a straight addition to the doughs. To make the emulsion use 1 quart of hot water per lb. of lecithin. Weigh the required amount of lecithin into a bowl. Heat the water to 140°F., add gradually to the lecithin and whisk vigorously. Leave for a few hours and whisk again when a complete emulsion should be formed.

This emulsion is then ready for use as and when required for bread, fermented buns, Vienna and milk breads, wheatmeal bread, pastries, cakes, etc.

The same strength of emulsion can be used in all these goods and sufficient for all purposes for two days can be made up in one operation. It is not advisable to store the emulsion for more than two days. The lecithin itself can be safely kept for many months if kept in a cool, dry place. Refrigeration makes the material hard and difficult to handle.

Table 1. Effects of Lecithin in Breadmaking

Stage	*Lecithin supplement* 0·33%
A Dough making	Softer but less sticky dough Water absorption increased.
B Fermentation	Better tolerance Higher percentages produce retarding effect.
C Dividing and handing up	Much improved handling properties Increase of resilience to rough treatment and dough less sticky.
D Intermediate proof	Less tendency to stick to pockets Less tendency to skin at surface.
E Final moulding	Good resilience to moulding action—promotes quicker recovery and response Good skin which gives good appearance.
F Final proof	Greater tolerance.
G Baking	Bake as normally.

Table 2. Effects of Lecithin Supplement on the Finished Loaf and Stored Products

Characteristics	*Lecithin*
A. *External Characteristics*	
1. Volume	Better or larger volumed bread
2. Shape	Improved and more symmetrical loaf
3. Crust	Improved bloom-pronounced effect on loaf crust.
B. *Internal Characteristics*	
1. Texture	Closer, more even texture
2. Crumb colour	Better crumb colour and sheen—maybe due to finer texture
3. Nature of crumb	Softer crumb, but strength maintained.
C. *Keeping Qualities*	Crumb remains soft and moist for a few days.

For bread-making use 1 lb. 5 oz. emulsion in the doughing liquor to incorporate with the flour during dough making per sack of flour. An extra quart of water may also be added to the usual liquor. Full dough making time should be given to obtain the maximum effect from the lecithin. Normal quantities of yeast and salt should be used. In machine bakeries where high speed mixers are in use the raw commercial lecithin can be added to the dough in the same manner as fat, using it at the rate of 6 oz. lecithin per sack of flour with extra water as above, or 15¾ to 16 gal. water according to the water-absorbing capacity of the flour.

Vienna, fancy and malt bread and fermented buns

Lecithin emulsion is best added to Vienna bread, fancy bread and malt bread at the rate of 1 oz. emulsion per 8 lb. flour. This gives a dough of a less sticky or drier nature which facilitates dough handling.

The resilience of the dough facilitates dough moulding without tendency to tear—it gives a better bloom to Vienna bread because there is less tendency to skin. There is an improved volume in the finished loaves and rolls.

The benefits obtained by using lecithin are:

1. Increased volume.
2. More shapely loaves or rolls.
3. Better crust colour and bloom.
4. Better oven development resulting in better filling of cuts.
5. Better crumb colour, sheen, softness and spring.

Vienna bread, rolls and fancy bread

	lb.	oz.
Flour	32	—
Salt	—	8
Yeast	—	12
Milk powder	—	12
Oil	—	6
Sugar	—	5
Lecithin emulsion	—	4
Water	18	4

Set dough at 72°F. for 2½ to 3 hr. Knock back at 1¼ hr. and 2½ hr. Scale at 8 to 10 oz. for Vienna and fancy breads or 2 oz. for rolls. Mould and prove on cloths. Bake in steam oven about 450°F.

The lecithin emulsion can be mixed with the oil or melted fat before adding with the liquor to the flour.

Malted brown bread

	lb.	oz.
Wheatmeal flour	10	—
National flour	4	—
Salt	—	¼
Yeast	—	7
Cooking oil	—	1¾
Lecithin emulsion	—	¼
Golden syrup	—	8
Malt extract	1	—
Water	8	2

Set the dough at 73°F. Time in dough 1¾ hr. Knock back at 1¼ hr. Scale at 1 lb. for 14 oz. loaves. Proving time 35 to 40 min. Bake in cool oven about 380-400°F.

Malted brown bread should be baked under cover of bread tins. This recipe produces very appetising malt bread of good appearance and volume.

Fermented buns

Ferment (1 qt.):

	lb.	oz.
Water	2	8
Milk powder	—	2
Sugar or syrup	—	2
Yeast	—	3½
Flour	—	8

Set ferment at 86°F. for ½ hr.

Dough:

	lb.	oz.
National flour	4	4
Salt	—	¾
Sugar	—	8
Cooking oil	—	8
Lecithin emulsion	—	1¼
Liquid egg	—	4
Fruit if desired	—	8

Mix sugar, oil, lecithin emulsion, egg and salt in a bowl and whisk together. Add to flour with ferment when ready. Make up a soft bun dough. Set dough at 78°F. Time in dough 1½ hr. Knock back at 1 hr. Scale and mould at 1½ hr. Proving time 25 to 30 min. Bake in hot oven about 450°F.

This recipe should produce bold, soft appetising buns of good appearance and excellent keeping qualities.

The same recipe without the fruit can be used to make doughnuts.

A maximum of 0·2% commercial lecithin can be used in the cooking oil for doughnuts. This is about ½ g. in 16 lb. of oil.

Short pastry

Lecithin emulsion is used with advantage in biscuits and short pastry. By its use one gets a smoother and more uniform paste because of the emulsifying effect of lecithin. The lecithin increases the tenderness of final products unless the fat is reduced, in which case the same tenderness and shortening is secured with less fat. The drier lecithin pastes machine better since they are not so sticky.

In short pastes use 2 oz. lecithin emulsion per lb. of flour and 6 oz. shortening per lb. of flour to obtain the same results as 8 oz. fat per lb. of flour. This shows a saving of 25% fat in making short pastry.

Short pastry

	lb.	oz.
Flour	1	—
Salt	—	¼
Sugar	—	5 or 6
Margarine and fat	1	8
Lecithin emulsion	—	4
Milk	—	10
Egg colour	—	¼

Short pastry for savouries

	lb.	oz.
Flour	4	—
Salt	—	1
Lard or compound fat	1	8
Lecithin emulsion	—	4
Water	—	10

Rub the fat into the flour until crumbly. Mix the sugar, salt, water or milk and emulsion together, and add to mixture and mix to a clear paste. Such paste will have a good bright appearance when baked and eats short and crisp as if made with the full quantity of fat.

Lecithin in cakes

When using lecithin in cakes it must be remembered that more than a strictly oil-in-water type of emulsion in involved. If lecithin is added at the beginning of the mix with the fat and sugar the viscosity is reduced to a point where less air can be beaten into the batter with consequent loss of volume.

(*Turn to page 376*)

Canadian Sardine Canning

By Elliot B. Dewberry

Fishermen at Black's Harbour, New Brunswick, working from boats in a circle and tightening the net on a catch.

THE small sea herring (*Clupea harengus*) is the fish used for canning by the sardine industry on the Atlantic Coast of North America. The canneries are situated in the State of Maine (U.S.A) and the adjacent Canadian Province of New Brunswick.

Herrings are caught off the Atlantic Coast as far south as Delaware Bay, but the small fish suitable for canning as sardines abound at certain seasons in the shallow waters around the coast of Maine, from Eastport to Rookland, and off the numerous islands in Passamaquoddy Bay (Bay of Fundy), and Southern New Brunswick.

In 1885 Messrs. Lewis and Patrick Connors commenced fishing for herrings in Passamaquoddy Bay, and the adjacent waters, which are the principal feeding grounds for these fish, and sold their catches to canneries along the coast of Maine. Later, with little or no capital, they started up a small factory for canning sardines in Southern New Brunswick, near their fishing grounds.

In those early days no machinery was available and all work had to be done by hand. Nevertheless, as time went on, and in spite of the many difficulties encountered, the demand for sardines increased. But the business suffered through lack of capital and in 1923 the whole undertaking was purchased by Messrs. McLean Bros. Modern machinery, plant and equipment was gradually introduced into the factory and coupled with progressive salesmanship in home and foreign markets soon brought the desired results. The hundred thousand case pack of 1923 rose to the record pack of over 750,000 cases in 1951. Thus the small undertaking of almost three-quarters of a century ago, steadily grew. Today, under the ownership of Connors Bros., Ltd., of Black's Harbour, New Brunswick, Canada, it forms the largest sardine canning industry in the British Commonwealth and gives employment to several thousands of fishermen and operators.

The Canadian Meat and Canned Foods Act (1949-52) and the Fish Inspection Act (1949) provide for the inspection and classification of canned fish and shell-fish and for the operation of canneries. These are inspected during the season by officers of the Department of

Fisheries, who examine all fish as they are landed for suitability for canning. Fish containing what is commonly known as "red feed" are considered unfit for human consumption.

The regulations also specify the quality of the oils used in packing the sardines and samples are taken for analysis when they arrive at the cannery.

The fishing season commences in April and continues until November, the peak being from the middle of July to September. The length of the canning season is governed by the probable market for the pack.

Food value

The herring is almost as rich in fat and about twice as rich in proteins as other foods of the same class. In addition the oil contains vitamins A and D.

The analysis of the herring may be expressed as: Protein 18%, water plus fat 80%, other components (mineral salts, etc.) 2%.

The following figures show the composition of beef, mutton and pork, compared with herring.

	Protein %	*Fats* %	*Calories per lb.*
Beef (whole ox) ..	9·04	13·25	728·0
Mutton (whole sheep)	6·99	22·88	1,095·9
Pork (whole pig) ..	14·77	24·46	1,306·4
Herring (whole fish) ..	18·00	20·00	1,180·0

The approximate average analysis of Canadian sardines (taken from the can), the components of which vary in different seasons of the year, is as follows:

Water-free substance ..	47·00%
Oil	25·50%
Protein	19·20%
Salt	1·50%
Mineral matter ..	3·80%

Steamed sardines in oil contain: solids and oil, 47·85%; oil, 25·52%; protein, 19·17%; ash, 3·84%; and salt, 1·54%. The figures for sardines in sauce are 29·63%, 7·55%, 18·02%, 3·37% and 1·19% respectively.

The following table shows the total production of sardines and the quantity and value of canned sardines exported from Canada during the three years 1951-1953.

	Production in thousands of lb.	*Exports*	
		Cwt.	*Value (thousands of $)*
1951 ..	64,804	100,207	1,766·8
1952 ..	54,508	161,184	3,069·4
1953 ..	37,067	76,396	1,404·7

The Canadian sardine canning industry of the Atlantic Coast of North America has developed during the last 70 years from a small factory backed by little or no capital to the largest sardine canning industry in the British Commonwealth. A detailed description of the industry is given in this article which deals with fishing, dressing, brining, pre-cooking, filling, oiling, sealing, processing, labelling and storage of the fish.

Fishing

Two methods are used for catching the schools of young herring, *viz.:* weirs, with enclosures or traps and stop nets together with purse seines. The fish are held in the nets for at least 24 hr., to cleanse themselves, as when caught they are often full of feed.

The canneries are notified by the captain of the seining boats when the herrings have been netted, giving the location, approximate catch and size of fish. "Carrying" or "run" boats, which have a capacity of 40 to 60 tons, are sent out, usually at night, to collect the fish. The holds of the carrying boats are divided into tank sections, a shallow layer of fish being loaded into each section. No ice is used, but if the catch cannot be landed in a short time, salt is scattered over the herrings as they are loaded into the hold sections. 280 lb. of salt are used for a hogshead of fish, which weighs about 200 lb.

Unloading

On arrival at the cannery the fish are hoisted out of the carrying boat in a large bucket holding about 500 lb. In some modern plants the herrings are unloaded by means of a large centrifugal pump, the hold of the boat containing the fish having been partially flooded with sea-water.

The fish are sluiced with water into tanks, being washed twice en route and passed over a wire mesh to remove the scales. The latter are made into pearl essence, or used as a fire extinguishing component.

The herrings must be small (from 4 to 7 in. long), free from feed, have a high oil content and be suitable in all respects for canning as sardines. Fully developed larger fish are not satisfactory, as they have a coarse texture, strong flavour, and considerable loss occurs in packing.

Dressing

Formerly the herrings were dressed and cleaned immediately after landing. A number of the smaller canneries still dress by hand but larger firms dress, trim and clean the fish in a single operation as they are filled into the cans.

Workers stationed on each side of the dressing table take 3 or 4 herrings in the left hand and cut off the heads with a knife or specially designed shears in a single movement. They then pull upwards and outwards in a second and simultaneous movement as the cut is completed, removing the visceras with the heads. The dressed fish are placed in pans at the worker's side, the offal being passed through openings in the table into receptacles beneath.

Brining

Brining or pickling is carried out in order to improve the texture of the flesh, make it firmer and impart a flavour to the canned product. Wooden tanks are used for the process, each of which is 5 ft. long, 3 ft. wide and 3 ft. deep and has a capacity of 45 to 50 bushels of herring. The brine consists of a strong salt solution (90° to 100° salinometer). The time of salting varies from 20 min. to 3 hr., depending on the size and fatness of the fish and the atmo-

spheric conditions pertaining at the time. This is also determined by the appearance of the skin and the degree of firmness of the fish. Over-salting causes wrinkling of the skin. A total salt content of from 2·5 to 3·5% is considered satisfactory in the canned product. After brining is completed the fish are drained, washed in clean water and conveyed on an endless slat-belt to the "flaking" machine.

A "flake" is a rimless tray with a framework of stout iron wire and covered with ¼-in. mesh wire screen. It is about 3 ft. long, 18 to 22 in. wide and holds about 100 to 125 herrings. The empty flakes are fed into the machine where a thin layer of fish from the conveyor is spread uniformly on each. These are stacked afterwards on movable racks each holding 25 to 30 flakes.

Packing tables at Connor's cannery where the sardines are fitted into cans. Filling is a skilled job as the same number of equally sized fish must be placed into each can. Very small fish are cross-packed in contrast to the usual longitudinal filling.

Pre-cooking

Pre-cooking by steam is the most commonly used process as it is cheap, economical and produces the desired sardine flavour.

The racks are wheeled to the steam cooking apparatus, which consists of oblong chambers (having drainage to carry off the escaping moisture) large enough to admit four racks of flakes. The chambers have tightly fitting doors and are equipped with blow-off valves, which are left open to permit of rapid steam circulation without building up pressure. Dry steam is passed into the chamber at 100-lb. pressure and the fish are steamed from 8 to 20 min. according to size.

After pre-cooking the racks of flakes are removed to a drying room where warm air at about 160°F., produced by a blower fan and heating coils, circulates round the fish. Drying is accomplished in from 30 min. to 2 hr.

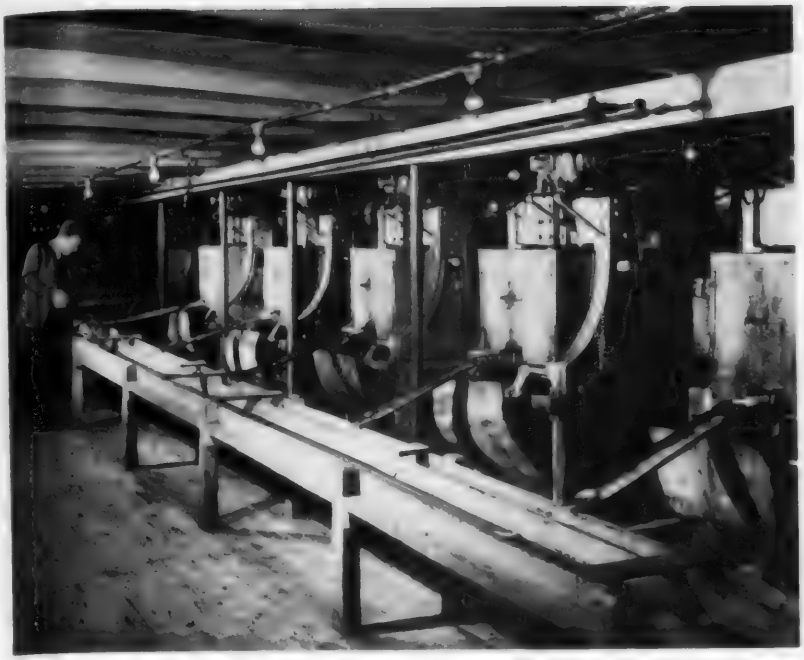
Pre-cooking by frying the fish in oil is still used by some firms for fancy grade packs of sardines. It produces an excellent product with a moisture content of about 65%, which is considered the optimum for canned fish. The chief objection to the process is the high cost of the oil, which has to be changed frequently during frying to prevent oxidation. When this method of pre-cooking is used the fish have to be dried beforehand at 100°F. for about 2 hr. with a consequent loss of moisture of about 12%. Frying takes place in shallow metal tanks containing a vegetable oil (winter-pressed cotton-seed oil) heated to a temperature of 230°F. The flakes of herring are passed by conveyor through the heated oil at a rate to ensure sufficient cooking, which is usually about 4 to 6 min., according to the size and condition of the fish. This is ascertained by breaking off the tail fin, *i.e.*, if it is brittle and breaks off easily it has been sufficiently cooked. The flakes of cooked fish are stacked again in the racks and wheeled to the drying room where they are drained and dried by heated air (100-120°F.) from 1 to 2 hr. and left to cool.

Filling the cans

In the modern method, the racks of sardines are wheeled into the packing room to a long table having a conveyor in the centre, about 2 ft. above working level. The women packers with trays of empty cans sit in rows down each side of the table. The flakes of fish travel along the top conveyor. As each can is filled it is placed on the return conveyor running flush with the top of the table and is then carried to the oil and can sealing machines.

Considerable skill is required in filling as the same number of equally sized fish must be placed in each can. The packers, using shears or scissors, snip off the heads of the small sardines. If the fish are of medium size, the head and tail portion are removed but in the case of larger ones only the tail portion is used. Loss in trimming varies from 15 to 60% of the original weight. Trimmings and waste are removed to a fish-meal plant. Should the fish have been dressed "raw" they are only trimmed to fit the cans.

The sardines are firmly packed longitudinally with the silver side uppermost, with the heads towards the ends of the cans and tails overlapping the middle. Very small fish, which require careful handling, are "cross-packed," *i.e.* laid in parallel with the ends of the can. In packing the larger ones, the heads and tails are alternated to make an even layer.



From this bank of sealing machines the cans of sardines flow on to the conveyor belt which takes them to the sterilisation retorts. In two operations the sealer rolls make a double seam, rolling the edges of the can and cover together.

More than 90% of the sardines are packed in the ¼-size cans which contain 4 to 15 fish (usually 11 to 15) in the standard grades. Special packs may contain as many as 30 small sardines.

The majority of the sardines are packed in winter-pressed cottonseed oil. Some, however, are canned in olive oil, vegetable salad oil, or soya bean oil. Mustard or tomato sauce is used instead of oil with fish of larger size, the sauce being placed in the cans before putting in the fish. A few small consignments are packed in special spiced oil, spiced vinegar sauce or other special sauces.

Two types of oiling machines are in use. In the first, trays containing 20 to 25 cans are oiled simultaneously. In the second type, as each can passes through the filling machines it trips a lever, sending a jet of oil into the can. The oil is heated to 180°F. The amount to be used is governed by legislation, *viz.*, a minimum of 4 lb. per case of standard packs and 5 lb. per case of "extra standard" and "fancy" grades.

The filled cans are conveyed to the feed side of the sealing machine. The covers are placed on top of the cans and a conveyor carries them under the roller heads of the machine which revolve at a rapid rate. In two operations, the sealer rolls make a double seam, rolling the edges of the can and cover together, thus hermetically sealing the can. A rubber compound gasket is sealed with the cover, which allows for contraction or expansion.

Processing

The sealed cans are conveyed by belt conveyor direct to chutes in the processing retorts. Damage to the cans by falling is prevented by partially filling the retorts with water. When the retorts are loaded, any water not displaced is blown out by steam. Each retort holds from 5,000 to 7,000 cans and is fitted with an automatic recording thermometer and pressure gauges, etc. In some instances the retorts are constructed with "fish-tail" chutes, the cans sliding down these without becoming damaged.

In connection with the conveyor system, another pattern retort, having a capacity of 65 to 120 cases, is of a modified vertical type, narrowing at the top with an opening of about 1 ft. in diameter. At the base is a small door through which the cans after processing drop to a conveyor.

The time of processing varies from 30 min. at 240°F. at 10 lb. pressure to 90 min. at 220°F. at 3 lb. pressure. Research laboratories, however, recommend 45 min. at 240°F. In the automatic control system, the steam is turned off and compressed air is admitted to retain the pressure. Cold water is then automatically run in until the temperature in the retort drops to 100°F. This method gives a more accurate control, rapidly cools the cans, reduces risk of overcooking and minimises the amount of can washing.

The cans, after processing, pass directly on to a steel conveyor belt to the cleansing tanks. Here they are sprayed with a hot alkaline solution and then with clean hot water under pressure, to remove the cleanser. They pass automatically out on another belt to tables for drying and cooling.

The cans are subjected to thorough inspection for leakages, dents or any suspicious evidence of spoilage defects known as swells, springers or flippers.

Labelling and storage

Labelling and casing usually takes place within a day or two after packing. Women, who pack the sardines, may also do the labelling and casing, so as to give continuous employment to the cannery workers.

The label may be embossed on the lids of the can previous to use, by stamping them with a die and then placed in the carton without any additional label. In some instances the cans are wrapped by machine in heavy paper, with the label printed on the portion of the paper covering the lid. Other consignments are wrapped by hand in semi-transparent paper or in a "glassine" wrapper, enclosing a key, and the labels are then pasted over the papers on the tops of the cans. Lithographed cans, with the label enamelled on the lid, are most widely used. Where

large quantities of different varieties have to be finished simultaneously a labelling machine is used.

The cans are cased by hand in standard fibre-board cartons 15½ x 9 x 8½ in., holding 100 quarter size cans and weighing about 36 lb. Some canners, however, use a case holding 96 quarters and also a smaller carton holding 24 quarters. Export orders are packed in wooden cases.

Three-quarter cans are used for mustard sardines with net contents of approximately 11 oz. and cased in cartons containing 48 cans.

Some firms do not store the pack but after the cans have been labelled and cased they travel by conveyor to a railroad car outside the cannery. They usually hold about 1,000 cases. Every effort is made to dispose of the pack before the opening of the next season, as prices are liable to fluctuate from year to year.

Line of automatically-controlled retorts where cans of sardines are sterilised. Processing times vary from 30 min. at 240°F. at 10 lb. pressure to 90 min. at 220°F. at 3 lb.

Lecithin in the Bakery (*from page 371*)

In cake making lecithin emulsion should be added after all the desired volume is attained and at the end of the mixing, so that air already in the batter can be held with no loss of volume.

The over-use of lecithin can also cause a reduction of volume. Depending on the recipe and process the correct lecithin to use is 1 to 2% of the fat used. The precise level should be determined for each recipe. The first symptom of overuse is the loss of volume in the mixing bowl. Lecithin emulsion can be used in cakes as an improver, helping to improve the softness and keeping qualities, but should not be used as a fat extender.

The following recipe will show how much can be used to improve the quality of the cakes without detracting from volume.

Medium quality cake

	lb.	oz.
Fat	2	—
Sugar	2	8
Egg	2	—
Flour	4	—
Baking powder	—	2
Milk	1	12
Lecithin emulsion	—	1¼

The butter is made up by creaming the fats and sugar together to a light cream, then the eggs are gradually beaten in to get a light creamy batter. The sifted flour and baking powder are lightly mixed in along with the milk in which the lecithin emulsion has been mixed.

The cakes produced from this mixture were of good texture and volume equal to the mixture without lecithin and kept moist and soft for a longer period. This is equivalent to about 1·8% lecithin to the fat used.

Recent developments with regard to West Indian Federation increases the importance of industrialisation in the area to British manufacturers. A new booklet, "Opportunity for Industry" in Trinidad and Tobago, gives some idea of the favourable conditions which obtain. The development of secondary industries could be an important contribution to the solution of problems of over-population and unemployment in the British West Indies. The booklet is produced by the Trade Commissioner for the British West Indies, 31, Kingsway, London, W.C.2.

Two Fine Wines

"Read this book leisurely," suggests Mr. Patrick W. Sandeman of this short volume,* "just as a good port or sherry should be drunk."

The book sets out to answer questions which sometimes puzzle wine drinkers. It is written in everyday terms and avoids technicalities. Its purpose is to help the reader to buy wisely, store safely, handle, serve and enjoy both port and sherry to the best advantage. With these objects in view, it traces the history of these wines, describes how they are made, gives details of their inherent peculiarities and advises on their decanting.

Together with descriptions of such procedures as the "Boot and Flogger" method of corking vintage ports, suggestions are made for suitable ways of serving these wines. "Even the humble stewed prune can be transformed by the addition of ruby port and thick cream," the reader is told.

* *Port and Sherry*. London: Geo. G. Sandeman, Sons and Co. 1955. 63 pp. 28 plates.

Quick-Freezing Plant Gives New Opportunities to Jersey Growers

By Basil C. de Guerin

Quick-frozen peas, strawberries and raspberries have been produced in Jersey for the first time in a plant set up by the Jersey Canning Co., as an addition to their successful cannery. These facilities give the island's growers an opportunity to diversify their crops and already blackcurrants, runner beans, cherries and spinach are being considered, in addition to tomatoes which, of course, have been a Jersey speciality for years.

IT was inevitable that the freezing of local produce should follow the introduction of canning on the Channel Island of Jersey.

Since the opening of the new factory specially built for the latter process at Plat Douet Road, in the outskirts of St. Helier, on August 21, 1950, progress of the Jersey Canning Co. has been rapid and extensive, and has provided many a local grower with practical help by finding an outlet for his surplus produce.

Indeed this venture which was at first regarded somewhat doubtfully by the conservative islanders, has now won their support to the extent that crops are being grown specially for canning on contract terms which guarantee a satisfactory return to all concerned.

This is very different to the days when canning was considered only as the last resort of the tomato grower who, during a glut was faced with the alternative of selling his produce to the factory or allowing it to rot on the plant.

Indeed something of a revolution has been made in the established routine of the Jersey grower by presenting him with the opportunity to raise fruit and vegetable crops which, without the resources of canning, would be a dead loss to cultivate.

The isolation of an island some hundred miles from the nearest English coastline, and the difficulty of transporting fresh produce to mainland markets, have for centuries placed a restriction on the range of cultivation that only canning, and latterly freezing, have been able to overcome.

With the introduction of freezing comes a widening of the horticultural vista which should mean

The first stage in pea processing. Peas are unloaded from the growers' carts to the viner where they are separated from the pods.

Washer, grader and holding tank. The action of the washer follows that of a waterfall, foreign matter falling to the bottom of a succession of inclined shelves. After grading the peas are blanched.

a completely new source of income to the progressive grower who will no longer be compelled to rely upon potatoes and tomatoes for his living.

Already some farmers have been willing to try out the growing of peas for sale to the Jersey Canning Co., and these have now increased both their number and their acreage until this year over 200 acres have been planted as compared with barely half that area last year.

Ideal growing weather favoured the peas this summer and the yield was good. After the viner has separated the peas from their stalks the grower removes the residue which is ploughed back into the soil while fresh for manure.

This initial segregation is the only process done outside the factory building, and that is of course because of the dust created.

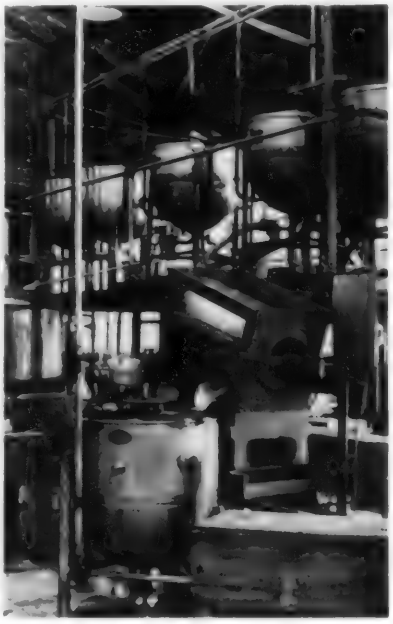
The factory

The two viners employed are situated in the large area of open space between the factory building and the offices of the company. The property extends over three acres of land, and the factory is of modern design and construction, the whole being on one floor and measuring 140 ft. in width by 400 ft. long, with concrete floor and the maximum of lighting and ventilation on the latest principles. Machinery, packing and grading benches, and the entire processing has been devised so that all may be visible at any one time to the managerial staff.

Adjoining the main road which passes the property is the building which houses the reception foyer, the offices of manager, secretary, and clerical staff, as well as the up-to-date laboratory and the first-aid room. This building is flanked by two roads.

In the rear of the factory itself there are modern cloakrooms for the workers and a canteen capable of accommodating 100 persons at one time. Kitchens equipped in the latest style, and a flat for the caretaker, with stores built for sugar, salt, and other ingredients are installed here, as well as reservations for carpenters' and blacksmiths' shops or other tradesmen's quarters as required.

These model and well designed premises were opened five years ago by the then Lieut.-Governor of Jersey, Lieut.-General Sir Edward Grasett, at a ceremony attended by leading islanders and other notabilities, who were welcomed by Mr. S. W. Smedley of the National Canning Co., who still maintains an interest in the Jersey Canning Co., the control of which is in the capable hands of Mr. J. S. Norman, who has been for 22 years employed by this company and its predecessor.



Tomato soup and ketchup production line.

Pea processing

The whole pea vine is brought in by the growers when the factory inspectors consider the crop is ready for harvest, and as conditions are suitable for processing.

After separation of the peas from the pods by the viners, they are carried to the winnower inside the building and here such residue as bits of leaf and pod are blown away.

The peas are then weighed and it is upon the weight of these shelled peas that the farmer is paid for his crop. It is interesting to note that any loss of good peas in these initial stages is of so small a percentage that it is negligible.

The peas next pass through an Olney washer. This consists of two parts, the whole operation being based on the natural action of a swiftly running stream or waterfall. The first part is a ripple box in which stones and solid matter fall to the bottom of a succession of inclined shelves. The second part removes any residue which may float to the top.

A visit to a washing tank is followed by grading into large, medium and small sizes by a special grader, after which they are blanched for a few minutes in boiling water which also helps to soften them. Then on to the rod washer in which split peas and shells are segregated and fall out of the machine through the rods.

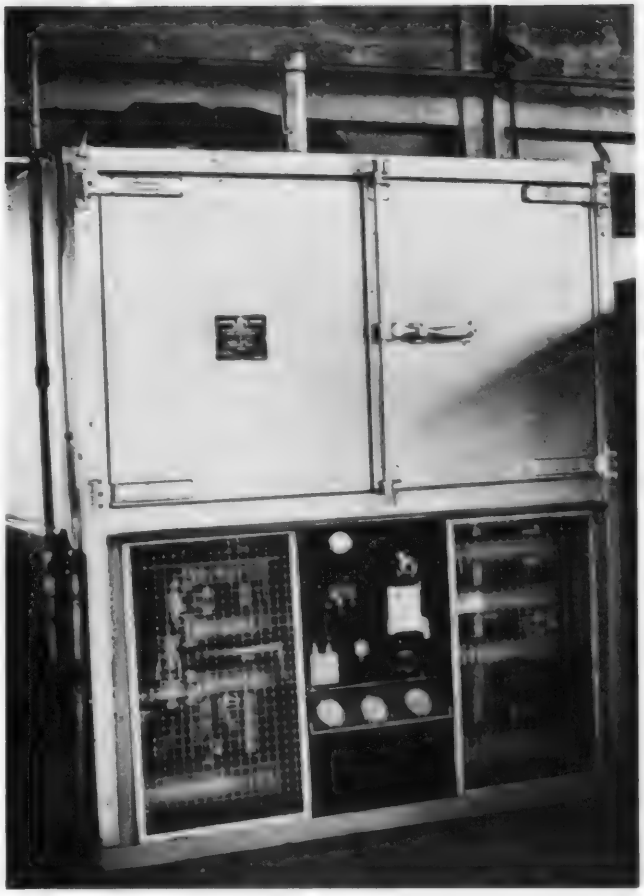
After this the human element enters into the processing for the only time. This is for the purpose of inspection, which is done on an endless belt flanked on each side by women who pick out by hand any discolored peas or foreign matter.

This final check-up of the article is succeeded by the moving belt conveying its load to the filling machine. It is from here on that the processes of canning or freezing diverge.

In the former a measured weight is filled into cans of whichever capacity and size the machine is set for, and the cans are filled with a brine-sugar solution. Lids are sealed on by a closing machine, and the cans are sterilised in retorts, after which they are cooled and stacked in the adjoining warehouse for labelling and despatch.

Quick freezing

For freezing, the filling machine is set to fill cartons of the required size which are placed in trays which are fitted into shelves in the Jackstone Froster. These shelves are hollow and contain the refrigerant and when the froster is full the shelves are electrically depressed upon each other at a pressure of around 2 p.s.i., which in the space of 2 hr. or so freezes the peas thoroughly and efficiently.



The Jackstone Froster. Peas are placed on hollow shelves containing the refrigerant which are depressed to a pressure of 2 p.s.i. They are frozen in 2 hr.

When this time has elapsed the cartons are transferred to the cold storage room where they remain until needed, at a temperature of -5°F.

Before the pea crop was ready, strawberries and raspberries had been treated, and other fruits and vegetables which it is planned to handle include blackcurrants, cherries, stringless runner beans, spinach or any fruit or vegetable for which there may be a market.

This factory has already proved a boon to Jersey growers, as of course its busiest season is that of the local outdoor-grown tomato crop which starts in September and lasts for six weeks.

During this time the factory works right round the clock in shifts and the procuring of labour, although it is unskilled, for this season is an annual problem. As it would not pay to import workers, appeals are made to local residents and employees in other businesses to put in time at hours which suit their convenience. The response has often been surprising and ex-service pensioners of high rank and retired residents have been glad to put in a few hours daily or nightly and rub shoulders with clerks and artisans in a manner which no doubt benefits their minds as well as their pockets.

Primarily of course the canning trade is for the export market and the annual sale of these preserved Jersey tomatoes is increasing steadily. At first the frozen products will go on to the island home market, firstly because quantities of any one product will not be extensive, and secondly because the elimination of refrigerated transport to Jersey will enable the price to be fixed at a rate which will benefit the local housewife.

Later the system of contracting with farmers to produce crops at a guaranteed figure will enable island produce to be raised specially for freezing, and besides creating a market for such goods elsewhere it will encourage the growing of crops which today are impracticable owing to the disadvantages of transport.

The cold storage room and other intermediate accommodation was built entirely by the staff of the Jersey Canning Co. and has been erected within the same factory building as the whole of the rest of the processing. In addition to this storage capacity of some 50 tons, there is a reserve storage plant on the island which can if necessary accommodate a further 400 tons.

SUPPLIERS OF PLANT AND EQUIPMENT

Viners: *Mather and Platt, Ltd.; F. C. Kane, Ltd.*
Winnower, Olney washer, grader, blancher, holding tanks: *Alfred Dodman, Ltd.*
Rod washer: *Hart and Sons.*
Filling machines: *Robert Kellie and Son, Ltd.; Mather and Platt, Ltd.*
Froster: *Jackstone Froster, Ltd.*
Cold store machinery: *L. Sterne and Co., Ltd.*

Peanut Butter

(*from page* 365)

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The natural purity, colour and flavour of fruit juices are said to be preserved by the fruit juice de-aeration and pasteurisation plant described in a new leaflet from the A.P.V. Co. Ltd. The plant is claimed to prevent fermentation, the destruction of pectin and loss of Vitamin C due to oxidation. It is presented in schematic flow diagrams and as a standardised layout and is illustrated as installed in a number of fruit juice factories.

Advances in Food Technology

VINE WASTE

Continuous Alcohol Still

An Argentine inventor, E. Petrich, has designed and built a continuously-operating plant for the distillation of vine waste to produce alcohol and tartrates. With this plant, several operations, including dilution and distillation proper, formerly carried out individually, are combined in a single continuous process with a minimum of plant wear. In addition steam consumption is much smaller compared with traditional stills.—E. Petrich, *Alimentación e Industria*, 1955, **1**, 76.

MEAT SPICES

Germ Counts

Tests at the Federal Institute for Meat Research at Kulmbach have shown germ counts varying between 100 and 100 million aerobic germs per gram of spices. There is no reliable indication of the germ count that can be safely tolerated, and it appears to be desirable to lay down certain standards in this respect. In any case, manufacturers of meat products would be well advised to check the germ contents of the spices used by them.—K. Coretti, *Die Fleischwirtschaft*, 1955, **7**, 305.

ORANGE JUICE

Chromatographic Determination of Amino-Acids

The authors have critically examined methods for the quantitative determination of amino-acids, separated by paper-chromatographic methods, *viz.* (1) measuring the colour intensity of the spots by direct visual comparison, (2) measuring the size of the spots with a polar planimeter, (3) measuring the colour intensity of the spots spectrographically, and (4) measuring the colour intensity of the spots by means of a colorimeter consisting of a suitably designed photo-electric cell. The last-named method is regarded as the most accurate, but other methods, properly used, can furnish adequate approximations.—C. Petronici and G. Safina, *Conserve e Derivati Agrumari*, 1955, **4**, 11.

SAUSAGES

Effect of Sugar on Curing

Practical experience has shown that sugar improves the curing and processing of dried sausage. Flavour, tenderness, curing uniformity and curing speed are improved. The reason for this is not yet known. It is thought that the sugar helps to create the *p*H most suitable for curing. The exact chemical reactions involved are still insufficiently explored. All that can be said with certainty is that a judicious admixture of small quantities of sugar is beneficial to the curing process.—R. Grau, *Die Fleischwirtschaft*, 1955, **7**, 182.

FRUIT SUGAR

Origin of Free H_2S

At the Food Research Station at Palermo, Sicily, when 67 samples of fruit sugar were distilled at reduced pressure and at temperatures not exceeding 35°C., no trace of sulphuretted hydrogen was found. When, however, some of the same samples were distilled at normal pressure and in a flow of steam, hydrosulphuric acid was found. Rejecting the theory of a natural decomposition of the sugar itself, the research workers suggest that any sulphuretted hydrogen found in the distillates of fruit sugars is a product of the decomposition, through heat, of a more complex compound, cysteine. This assumption has been confirmed by means of cysteine tests with cationic resin.—A. Micale and R. Sara, *Conserve e Derivati Agrumari*, 1955, **4**, 9.

CANNED FOOD

Aseptic Removal of Gas

It is often necessary to analyse the gas contained in the free space of food cans, especially in the case of blown cans, in order to ascertain the reasons for the damage. Particular care must be taken to avoid any contact between the gas and atmospheric or other agents containing germs which might falsify the results of the analysis. Two French research workers (Cheftel and Thomas) have constructed a very simple device which permits the completely aseptic removal of the gas. It consists of a system of sterilised flasks and tubes permitting the displacement of the gas to be investigated by means of sterilised air.—*La Revue de la Conserve*, 1955, **10**, 127.

MILK POWDER

Influence of Drying Conditions

Drying conditions have an important bearing on the quality of milk powder. Special attention must be paid to the degree of preconcentration of the milk as well as the thickness of the layer when drying on rollers, or the size of the drops when using spray drying, the temperature to be applied, and the time of its application. Other important factors are the relative humidity of the air in the drying room and the treatment of the milk powder after the drying proper when the milk is subjected to influences of greater potential importance than during the drying. By observing certain rules, it is possible to dry raw milk so carefully that the colloidal system suffers no damage, and the milk produced from the powder has actually the same properties as the original milk.—P. D. Clausen, *Fette, Seifen, Anstrichmittel*, 1955, **57**, 253.

Machinery and Equipment

Candy kneading machine

Automatic candy manufacture—hitherto interrupted by the manual kneading operation—is now possible on a truly continuous basis with a new Italian kneading machine, according to its makers, Ruffinati of Turin. The machine is said to reproduce the movements of a skilled candy maker in a very much shorter time.

The sugar batch, colour and flavouring is fed to the machine from a vacuum apparatus. The makers claim that the kneading is completed in about 4-5 min. and that the prepared batch has the desired degree of transparency and softness and is free from air bubbles.

The machine can be used as a cold table when not in operation, as it is cooled by water circulation. The parts in contact with the sugar batch can be electrically heated.

Improved steam traps

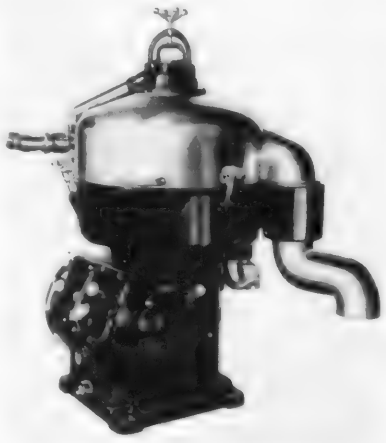
Newly designed and re-designed steam traps have been announced by Spirax-Sarco Ltd. They include prototypes of a new range of ball-float steam traps in three series, FT-600, FT-700 FT-800, which will gradually replace the corresponding sizes in the present series. It is claimed that the new steam traps cover the existing full range of steam pressure requirements and in certain sizes give even greater condensate discharge capacities. The FT-700, for example, is said to give discharge capacities up to 10,000 lb./hr. and the FT-800 series as great as 40,000 lb./hr. Special features of the new traps are easily interchangeable units for thermostatic air release and steam-lock release according to the conditions and requirements of the particular installation.

Water de-ionisation plant

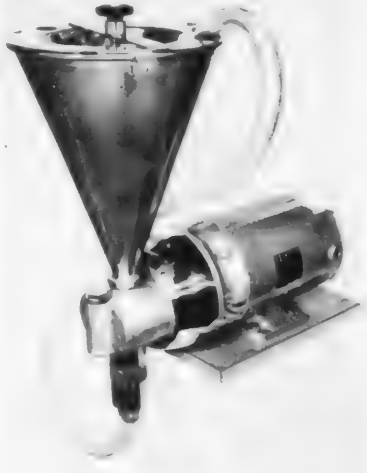
A small twin de-ionisation plant will be shown in operation by John Thompson-Kennicott Ltd. at the Engineering and Marine Exhibition, London, September 1-15. This type of plant has been developed by the company to produce water of the very highest purity for modern power station plant and certain industrial processes where this degree of purity is required. The degree of purity achieved is the equivalent of or greater than that obtained by techniques dependent on evaporation and condensation as have previously been necessary. The cost of the process, however, is about 2s. 6d. per 1,000 gal. as against about 5s. 6d. in the case of evaporation techniques.

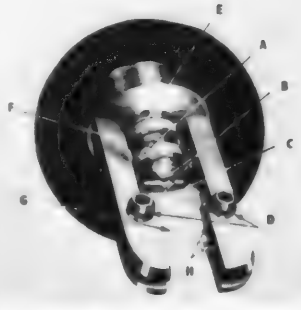
The process employs pressure vessels containing synthetic resins, the contained salts in the raw water being converted to acids in one vessel and the acids being removed in the second vessel. The resins in these cation and anion exchangers are regenerated by acid and alkali treatment respectively.

The ion exchange vessels and their pipework are constructed of rubber-lined mild steel. Pumps or injectors are used for adding the reagents and the whole process can be made automatic.



De Laval nozzle separator.





New ultrasonic emulsifier.
(*Below*) Vibrating element.
A—jet; B—distance between jet face and blade edge 3·5 mm; C—ground edge of blade; D—blade retaining screws; E—jet locking collar; F—blade arms; G—vibrating blade; H—blade packing pieces.

Centrifugal separators

Centrifugal separators, pumps and plate heat exchangers are being exhibited by Alfa-Laval Co. Ltd. at the Engineering and Marine Exhibition, at Olympia. Among them is a new large continuous De Laval three-way centrifugal nozzle separator (QX 210-00) for the separation of solids from a liquid or two immiscible liquids. The machine is recommended for starch concentration, gluten stripping, fish oil separation, and effluent treatment.

Among the centrifugal separators on view is the De Laval de-sludger. It is said to have been particularly successful in the fish oil and fish meal industry.

Ultrasonic emulsifier

Small-scale ultrasonic emulsification is practicable with the *Minisonic* self-contained homogeniser, according to the manufacturers, Ultrasonics Ltd. The machine has been designed for laboratory and small batch production on the same principles as the *Rapisonic* method of emulsification and homogenisation by ultrasonic cavitation. A similar vibrating element is used in the new machine so that a product can be transferred from the laboratory stage straight into full-scale production without altering the manufacturing technique.

The machine is a self-contained unit. No pre-mix vessels or ancillary plant are required. Emulsions can be prepared to any given formula in batches of up to 1 gal. The continuous phase in the primary funnel can be recirculated *via* the vibrating element using a flexible hose, and the disperse phase can be introduced through the inner funnel at regulated speed. The finished product can be discharged, again using the flexible hose. Premixed emulsions are processed by using the primary funnel without the inner one.

Aluminium trays for Turkey

After securing the contract for 60 Smith's-Commer mobile shops for the Migros-Turk organisation in Istanbul, Smith's Delivery Vehicles Ltd. have now also obtained the order for 23,000 aluminium trays which are being made by the Warwick Production Co. Ltd., an associate company of Almin Ltd.

The total value of this unusual contract is £11,000, and all trays are to standard dimensions as used by the Swiss Migros organisation in the mobile shop system employed in that country.

Three standard sizes of tray are used and Warwick Production Co. are also supplying the special extruded section tray angles which are infinitely adjustable in the partitions. For the purpose of pre-loading, duplicate sets of trays are held available in the warehouse. The special Migros system of stock control has made it possible in Switzerland to replenish a mobile shop in a matter of 25 min. with merchandise sufficient for weekly sales averaging £1,000 in value.

Fluorescent lighting for bacon curers

Fluorescent lighting has been installed in the new Amersham premises of G. Brazil and Co. Ltd., bacon curers and pork pie manufacturers. Some 25 Mazda twin-lamp fluorescent batten fittings are ceiling-mounted in the new office block, in the retail butcher's shop and in the cutting-up rooms.

Automatic liquid scale

Calculating the weight of liquids from the cubic measurement has long been considered unsatisfactory and inaccurate. Accuracy is affected by the accumulation of dirt, the presence of scum and entrained air and the expansion and contraction of metal tanks under varying temperatures. Also the density of the liquid may vary continually so that the factor for calculating the weight from the cubic measurement can never be accurately fixed.

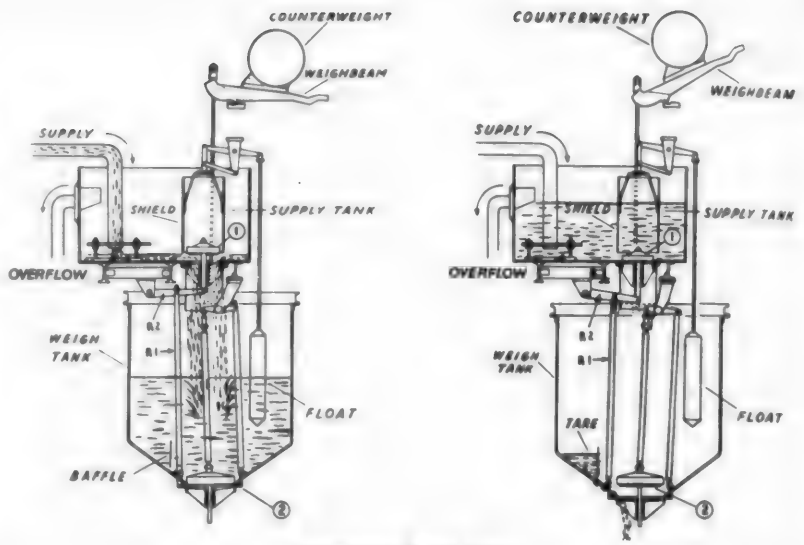
The Fletcher automatic liquid scale is said to have none of these disadvantages and requires no attendant. It continuously and automatically weighs liquids of all viscosities up to 150,000 S.S.U., and is suitable for weighing edible liquids, chemicals, spirits, oils, hot or cold water, etc.

It is based on the principle of tare weighing, the operating power being provided by the liquid being weighed. The scale will continue to discharge a given weight of liquid while the supply is maintained. The rate of weighing is controlled by an oil buffer which works smoothly and without shock. None of the balance parts are in contact with the liquid, thus corrosion and wear are negligible. Exactly the same weight of liquid is discharged at every weighing and an automatic counter registers either the number of weighings or the total tonnage. The settings can be locked and any government excise scale affixed as may be required.

The highest possible accuracy of weight discharge is achieved by the self-regulation provided by the tare weight, and the sharp precision with which the operations of filling and emptying the weigh tank are determined.

The scale can be fitted with an automatic sampling device, and also with a small tank which provides for the automatic addition of a predetermined but variable volume of secondary liquid with each discharge of the weigh tank.

The scales are built in four sizes to deal with ¼, 1, 2 and 3½ tons of liquid per tip respectively, giving a maximum capacity of 150 tons/hr. of a liquid having a viscosity equal to that of water.



Automatic liquid scale

(*Left*) Filling position. The rising liquid raises the float, thus lowering the shield around the feed valve (1). The serrations in the bottom edge of the shield allow liquid to dribble into the tank until the counterweight is overcome. The tank then sinks, closing the feed valve and opening the discharge valve (2) to empty the tank. (*Right*) The liquid held back by the baffle plate flows through a small outlet until the tank reaches the desired tare weight. The raised counterweight then causes the weigh beam to tilt, lifting the tank back to the filling position, closing the discharge valve, and opening the feed valve.

Part of the new Amersham premises of G. Brazil and Co. Ltd., lighted by twin-lamp fluorescent batten fittings.

News Digest

Food Research Association to Campaign for New Members among Small Firms

MR. E. E. WELLS, Rowntree and Co. Ltd., retiring chairman of the Council of the British Food Manufacturing Industries Research Association, emphasised at the Association's annual meeting in London recently the need for small food manufacturers to be research-minded.

Appealing to them to join the Association, he said that many small firms had "problems of which they are all too frequently unaware." They were unable to appreciate what science and technology could do for them.

To reach such manufacturers and attract them into membership, it was necessary to give practical proof of the type of assistance which the Association could provide. This could best be done by visiting the factories concerned and to this end the Association was setting up a consultative and advisory unit.

Mr. Wells referred to the question of food additives as one "which must be very much in the minds of all responsible food manufacturers today." He went on:

"Whether we like it or not, one of the effects of the new Food and Drugs Act is to place upon food manufacturers as the users and chemical manufacturers as the suppliers the responsibility of providing evidence that certain materials used in food manufacturing and processing are not injurious to health."

Progressive food manufacturers realised that there was a need for a Testing Station for these additives, but, without considerable expansion of its laboratory accommodation and staff at Leatherhead, the Association could not undertake such work. It would seem that the answer was for a new co-operative Biological Testing and Research Station to be set up.

A meeting had been held at the Department of Scientific and Industrial Research at which representatives of various organisations and industries had been present. Further meetings were to be held soon to discuss plans and finance. The Government had intimated that a grant would be available and it was hoped it would be generous.

"From the industries' point of view," said Mr. Wells, "there are many good reasons why this type of testing should not be carried out entirely under official auspices." It was "vitally essential" that interested industries should have a major share in the management of any such establishment. But industry could not expect to achieve control unless its financial contribution warranted it.

Mr. C. O. Barber, Batchelors Peas (Southall) Ltd., moved a vote of thanks to Mr. Wells for his work. This was carried unanimously.

Earlier in the meeting, Sir Frank Engledow, F.R.S., Drapers' Professor of Agriculture at Cambridge University, was re-elected president of the Association for the ninth year. Sir Frank has been for many years closely connected with the development of tropical agriculture on which so many of the raw ingredients of foods manufactured in Britain depend.

Mr. J. G. Mathieson, of Clarke, Nickolls and Coombs Ltd., and Lt.-Col. G. R. Harding, D.S.O., of Aplin and Barrett Ltd., were re-elected vice-presidents. The Council of the Association elected Mr. R. P. Woollard, London Oil Corporation Ltd., the previous deputy chairman, as chairman, and Mr. C. O. Barber, Batchelors Peas (Southall) Ltd., deputy chairman.

A new member of the Council is Mr. George Walsh, B.SC., F.R.I.C., a director of Barratt and Co. Ltd. He was elected to take the place of Mr. H. O. Barratt, who did not stand for re-election as he wished to reduce his activities.

One-third of the members of the Council retired on a rotational basis and were re-elected.

Seaweed research institute closing

The Institute of Seaweed Research at Inveresk Gate is to be closed in its present form. This decision follows a review of its work by the Advisory Council on Scientific Policy. Arrangements will be made to continue fundamental studies and an information and advice centre may be maintained.

Valuable information has been yielded by the work of the Institute, reports the Council, who found that the work had reached the stage when any further exploitation of seaweed resources should be undertaken by industry rather than by a publicly financed institute. Grant aid for most of the Institute's present programme will end during the next year.

During its lifetime the Institute has surveyed almost all the Scottish seaweed resources and developed mechanical harvesting methods, and extraction processes for all the major constituents of seaweed. The alginate industry is now well established in Scotland.

Smedley's signorine

Thirty-four Italian girls have been "imported" by Smedley's Ltd. to work at their Wisbech canning factory. They will be here for six months. This is the first time that the factory has had to employ foreign labour to help out during the season.

F.M.C. area boards

The Fatstock Marketing Corporation is to set up Area boards (to be subsidiary to its main board) in each of the ten F.M.C. areas covering the United Kingdom. The area boards will be primarily advisory rather than executive bodies. Each board will include all directors of F.M.C. who are representatives of the area on the main board, together with the area marketing director or representative. There will also be a number of part-time members.

Australian canned fruits record

An all-time record shipment of Australian canned fruits arrived in this country recently.

"This record shipment, with an insured value of nearly £500,000, emphasises the important position that the Australian canned-fruits industry has gained in the export trade," said Mr. Robert Heanley, of the Australian Canned Fruits Board.

"A total of 4¼ million cases is scheduled to arrive in the U.K. during the season and this represents an export value of over £11 million sterling.

"Since the war, the fruit-canning industry in Australia has grown until it now supplies over half the U.K. imports of canned fruit. This is almost three times the pre-war figure. There are now 42 canneries engaged in exporting to Great Britain, compared with 17 in 1939. The importance of this trade is indicated by the fact that over 70% of Australian canned-fruit production is exported to Great Britain."

Total value of all Australian exports to the U.K. in 1953-54 was £225,547,500 sterling.

R.S.I. becomes R.S.H.

The Royal Sanitary Institute will in future be known as the Royal Society for the Promotion of Health.

British wheat for milling

The flour milling industry has undertaken to use a minimum quantity of 1¼ million tons of home-grown wheat from this year's crop as an active measure of co-operation with wheat producers and as a recognition of the importance of British wheat to the milling industry.

This is the first time since complete decontrol of the grain trade that an undertaking has been given in respect of a specific quantity.

Shell's new company

A new company—Shell Chemical Co. Ltd.—has been formed to concentrate all Shell's chemical manufacturing and marketing activities in the British Isles and Eire. The company, which has an authorised capital of £10 million, will take over the activities of Shell Chemical Manufacturing Co. Ltd. and Shell Chemicals Ltd. The activities include the manufacture and marketing of detergents, solvents, resins and agricultural products and chemical intermediates. The recently acquired Petrochemicals Ltd. will become a subsidiary of the new company and will continue as a separate entity.

Slaughterhouse report

Recommendations for the general principles of siting slaughterhouses are made in the report of the Interdepartmental Committee on Slaughterhouses for England and Wales which was published recently as a white paper. The recommendations are aimed at meeting the requirements of both the old and the new methods of meat trading and to effectively bring about the desired degree of concentration of slaughterhouse premises in order to promote hygienic meat handling. They include proposals that minimum standards should be laid down by the Minister of Food and enforced by local authorities. The date by which slaughterhouses in any area should conform to these standards should be determined after consultation with the local authorities concerned, and after this date has been appointed the Minister's consent should be required for the building of new slaughterhouses or for extensions to existing ones.

The report reviews the existing legislation relating to slaughterhouses, the effect that the control scheme had on licensing and the situation since decontrol.

The Fatstock Marketing Corporation has welcomed the report. A spokesman of the Corporation commented: "The committee is to be congratulated. It has not been led astray by any notion that concentration is a panacea in itself. It has been guided entirely by the principle that meat should be properly handled and that there should be adequate inspection.

"The report meets most of the points put by the deputation which made representations to the committee on behalf of F.M.C. If the report is adopted it will not be possible for the 'private' trader, including F.M.C., to be deprived of a slaughtering licence so long as he conforms to the minimum standards laid down.

"The suggested period of twelve months for local authorities to review the slaughtering facilities in their districts and to inform the Minister of the proposed appointed date by which they consider that adequate slaughtering facilities of the required standard will be available appears to be somewhat optimistic. Nevertheless, with goodwill on the part of all concerned the aims of the report should be achieved."

Mr. F. A. C. Guepin
Chairman of Shell's new company

Bakery film strip available

The National Board for Bakery Education announces that the eighth film strip entitled "The Laboratory Testing of Wheat and Flour" has now been completed. It consists of 46 full size frames (24 × 36 mm.) in colour, showing the operations and equipment involved in flour and wheat analysis, together with an excellent commentary. Educational establishments may obtain copies of the film strip and commentary at the specially reduced price of 12s. 6d. for the strip and 2s. 6d. for the commentary, on application to the secretary of the National Board for Bakery Education, 1, Buckingham Palace Gardens, Buckingham Palace Road, London, S.W.1.

Strawberry research

Research on strawberry growing was the subject of a Members' Day at East Malling Research Station recently. The director, Dr. F. R. Tubbs, welcomed the members and introduced the programme, which paid special attention to the production, issue and propagation of clean planting material. The programme concluded with a general discussion.

Warmth for window-shoppers

Philips infra-red lamps, mounted in a specially built canopy above the showroom windows of a shop at Bridport, Dorset, are believed to be the first electrical installation of its kind in this country for warming of window-shoppers.

The canopy, 14 ft. in length and 3 ft. in depth, stands 9 ft. above pavement level. Twenty-three infra-red lamps are mounted in 3 rows, 8 in. apart, in staggered formation. A square section metal louvre, made up of 1½ in. sections 2 in. deep, is placed on the underside of the canopy, which also houses Philips fluorescent lighting.

Bread advisory service

A bread advisory service has been inaugurated by Procea Products Ltd. It will offer housewives and others responsible for catering a comprehensive service on the preparation of sandwiches and dishes which have a bread basis.

Mr. S. A. Lancaster, managing director of Procea Products Ltd., said: "The service also aims to help the shopkeeper. We hope he will co-operate in matters of sampling and demonstrations, for this can only be of mutual advantage. He will be able to show housewives the wide variety of ways in which bread can be used and will sell more bread as a result."

Meat bacteriology symposium

The bacteriology of non-sterile meat packs is the subject of the proceedings of the 1st International Symposium on Food Microbiology which have been published recently.

The proceedings are presented in 37 papers, with discussions, dealing with thermal processing, the importance of ingredients like gelatin and spices, the origin and significance of the important micro-organisms and the requirements of the consumer. Some papers are in French and German but all have English summaries. The proceedings are published in a single number of the *Annales* of the Pasteur Institute of Lille and are available from the publishers (Editions Medicales Flammarion, rue Racine, Paris) at 20s. inc. postage.

Export licensing changes

Under changes in export licensing control made by the Board of Trade licences will not be required (except for exports to China, Macao, Tibet and North Viet Nam) for the export of butter, casings and sausage skins of hog gut, and cheese.

British foods for Germany

British food products to the value of D.M. 2¼ million may now be imported by recognised German traders. The announcement, which has been made by the German Federal Office for Food and Agricultural Products, covers oat and barley products, canned vegetables, orange marmalade, jams, jellies, breakfast cereals, cocoa preparations, lemonade, mustard, pickles, soups, sauces, pet foods, vegetable extracts, table salt, and fish pastes.

Canned salmon import licences

Licensing arrangements for the import of canned salmon from North America have been announced by the Board of Trade. Specific licences will be issued against a joint quota for Canada and the U.S.A. to fish paste manufacturers, first-hand distributors and other traders.

The full amount of the quota has not yet been fixed, but it will not be less than that for the previous year. Licences will be issued in two parts, both valid until June 30, 1956; the first part will be issued shortly and the second as soon as the quota has been finally fixed. Details are given in Notice to Importers No. 739.

Quotas have been established for imports, under individual licences, of canned crab and canned salmon from the U.S.S.R. during the period July 1, 1955-June 30, 1956.

Details are given in Notice to Importers No. 744 dated August 6, 1955, issued by the Import Licensing Branch of the Board of Trade.

Electronics department

An electronics department has been added to the services provided by Technical Designs Ltd., specialists in technical publicity. It is hoped that the new department will cover every application of electronics.

Cream makers merge

Two synthetic cream manufacturers —Vitacream Ltd. and Malga Products Ltd.—are to merge to form Malga-Vita (Suppliers) Ltd. Both companies will continue to deal with their respective trade connections and to sell, under their own brand names, the different types of synthetic cream and bakers' sundries for which they are known.

OBITER DICTA

● The character of a nation is always shown in its drinking utensils.—*Prof. A. E. Richardson, P.R.A.*

● Would it not be possible for each egg to be stamped with the date on which it was laid?—*Letter to The Times.*

● British Railways still occasionally serves stew that defies analysis or a piece of cod that defies understanding. — *Lord Mancroft.*

● The best cure for hay fever is to lie in a cold bath and drink a strong cup of tea at the same time.—*Letter to Sunday Express.*

● Lili's face was like the bowl of a coffee-spoon, but she had one of those modern bodies that reminded him of a pair of nut-crackers.—*Woman and Beauty.*

● Fido gets his balanced ration with a daily variation to ensure a superbalance. . . . There are lollipop mixtures for the dog. —*George Schwartz reporting on U.S. supermarkets.*

● Distributors of welfare foods are in much the same position as the man who tried to sell genuine £1 notes for 10s. but attracted only one customer all day.—*Municipal Journal.*

● The "Gunaandal" came in on Saturday with 25 baskets of fish average about 65 lb. each and only about 5% were not edible. These were distributed among the hospitals. — *Sydney Evening News.*

● The ungrateful inmates of the City prison at Chicago rioted and broke furniture and needed 400 policemen to quell them, all because they had sausages three times a week.—*The Times.*

● Scientists at Rutgers University say that cats do not eat regularly unless they are petted regularly. They now include tickling the cats as a part of the feeding routine in nutritional studies.—*American News Service.*

● One of the advantages of being able to make food in factories is that it will release large areas of the world as playgrounds where men can follow for a time the traditional life of the hunter and fisher and regain touch with reality.—*Sir George Thomson, F.R.S., in the Sunday Times.*

Walls win savings award

The Southampton factory of T. Wall and Sons, where 75% of the employees belong to the firm's National Savings group, has been awarded the Southampton Industrial Shield for the best savings results among 60 local firms who compete for this trophy.

New company formed

The Coniston Engineering Co. Ltd. has been formed as designers of heavy projects and process plants. It is equipped to design and arrange the construction of process plants for the food, chemical and other industries. The chairman and managing director is Mr. L. J. Schwarz.

Glasgow tea merchants merge

A. L. Polson, Deacon and Webb Ltd., tea and coffee merchants, of Glasgow, have merged their business interests with Matthew Algie and Co. Ltd., also of Glasgow. Both companies are old established, the former having been set up in 1890 and the latter in 1863.

Change of name

The name of the parent company of the Heenan and Froude group has been changed from Heenan and Froude Ltd. to Heenan Group Ltd. Companies in the Group include Morton Machine Co., Ltd., makers of mixing machinery and Industrial Waste Eliminators, Ltd., makers of abattoir equipment.

Future for table poultry

Tremendous scope for attractively packed and processed poultry in the present period of high meat prices was visualised by Prof. Hendrie, of the West of Scotland College, when he spoke to 100 poultrymen attending a one-day school at Auchincruive recently. Poultry had grown into a lusty industry, the importance of which would increase as the agricultural margin of profit narrowed. There were excellent opportunities in the field of table bird production and particularly for attractively packed and frozen forms.

T. E. Whittle, head of the Poultry School, said that there was admitted scope for broiler production but that a word of caution was needed. The American market showed signs of serious saturation; the level of prices for table birds had been lower here since Christmas. The problem was under-consumption rather than over-production. That could be cured by attractive, efficient marketing linked with strong publicity. Scotland was unfortunate in that it lacked a strong demand for quality birds and that distance from the major London market added to transport charges.

APPOINTMENTS AND RETIREMENTS

MR. JOHN O. SEWELL has been appointed Comptroller of the British divisions of the Yale and Towne Manufacturing Company. He previously spent eight years as Comptroller of the Canadian division. MR. BERTRAM A. SHORTMAN has been appointed budget manager of the same company. He has spent 29 years with the company, the last five of which were as Comptroller.

*

MR. N. E. WILLIAMS has been appointed London manager of Southall and Smith Ltd., covering their interests in London and the Southern Counties.

*

MR. DOUGLAS ALLAN ROGERS has been appointed marketing manager for the Smedley Group of Companies. His new duties include the control and direction of the Smedley sales force in the field, sales training, and the conduct of sales campaigns. Mr. Rogers, aged 37, joins Smedleys from Norfolk Canneries Ltd. where he was sales promotion and marketing manager.

*

Three executives of the Fatstock Marketing Corporation have been appointed directors. They are MR. THOMAS J. SHAW, who is to become director of pigs and fatstock marketing; MR. D. C. MACQUEEN, who will be executive director, responsible for administration and organisation, and MR. R. F. DALY, who will be chief accountant to the Corporation.

*

MR. R. A. HENDERSON, representative of Polak and Schwarz, has been ordered complete rest for medical reasons. It is unlikely that he will be able to continue his activities until later this year. All enquiries should be sent direct to Polak and Schwarz (England) Ltd., 50, Great Cambridge Road, Enfield.

*

MR. BILL SELZER has retired from W. J. Bush and Co. Ltd. He joined them in 1920 and for nearly 20 years he has represented them in Lancashire and Cheshire. Mr. Selzer leaves with the good wishes, not only of his colleagues on the road, but of the whole of the staff of W. J. Bush, many of whom have known him for the whole of the time he has been with the company. We feel that many friends in the trade will also wish him well for the future.

MR. DOUGLAS SUTHERLAND is succeeding Mr. Selzer. He joined the company a few years ago in Australia where he has been very successful and has left many friends.

SIR ALAN A. SAUNDERS, chairman of the British Sugar Corporation Ltd., has been appointed chairman of the National Research Development Corporation in succession to Sir Percy Mills, who has resigned. Sir Alan Saunders is 62 and has been a member of the Corporation since June, 1954. His appointment as chairman is for four years.

Obituary

MR. ERIC ARTHUR BLANCH, a director of United Glass Bottle Manufacturers Ltd. and chairman of their subsidiary company, Kork-N-Seal Ltd. Mr. Blanch had been with the group since 1923 and had formed many friendships. His devotion to the company's affairs over this long period and his wise counsel will be greatly missed by his colleagues and friends.

Cutting fuel costs

Fourteen thousand industrial coal consumers are being urged to have all their boiler operators trained. The National Industrial Fuel Efficiency Service has posted a message to them stressing that proper training is the quickest way of saving fuel, now more than ever imperative because of the 18% rise in coal prices. They estimate that if every boiler operator were fully trained millions of tons of coal now wasted and adding to air pollution would be doing useful work.

Technical colleges throughout the country are willing to lay on courses, starting in September, in preparation for the City and Guilds Certificate exam next year, while N.I.F.E.S. is now organising, for launching in October, a system of training to be given at work and to be supplemented by a home study course.

Firms are being asked to make early contact with their nearest Technical college and with N.I.F.E.S. so that everything may be ready for a prompt start in September and October.

Lighting in a canteen

Care has been taken to ensure well diffused illumination in the open parts of the new canteen at the Scandinavia Mills of British Belting and Asbestos Ltd., where the lighting fittings have been arranged with due regard to the canopies. The canteen supplies 500 meals at breakfast, midday and tea, and two meals during the night shift.

Benjamin *Saaflux R.L.M.* reflectors with diffusing *Visor* covers have been installed in the open areas. The areas below the glass canopies are illuminated by Benjamin frosted well glass units mounted within the canopies. A more ornate fitting has been installed in the dining room which is illuminated by Benjamin *Bencolite M* enclosed lighting units, finished in bronze.

Pre-cooked porridge

"Porridge without the pot" has been introduced in Scotland by a new company, Carrick Cereals Ltd., of 45, West Nile Street, Glasgow. The porridge is pre-cooked Scottish pinhead oatmeal. It is made by simply spooning three tablespoonsful into a plate and adding boiling water to make a porridge of any desired consistency, adding malt to taste. Alternatively the porridge can be made by adding hot milk, in place of the boiling water.

It can be used also to thicken soups and gravies and wherever oatmeal would be used. It is being packed in 1 lb. and 2 lb. packs retailing at 1s. 3d. and 2s. 4d. respectively. So far distribution has been limited to the Glasgow area.

Resale price maintenance defended

That part of the Monopolies Commission Report which deals with resale price maintenance for branded goods is being considered by the Fair Prices Defence Committee. The trade organisations represented on the committee will study the majority and minority recommendations made in the report, in consultation with their members, and will communicate the results of this examination to the Government as soon as possible. The election promises of some 200 members of Parliament that they would discuss resale price maintenance with representatives of the committee is to be taken up. These M.P.s will be invited to receive deputations from constituency or regional representatives of trade organisations affiliated to the committee.

Mint sauce in court

Mellors Ltd. were defendants in a test case recently when they were summoned by Merton and Morden Urban District Council for selling garden mint in vinegar which contained an excessive amount of stalk.

There are no standards for this product and the case—the first of its kind—was brought for the magistrate to decide what was reasonably expected when the public purchased mint sauce. The product contained 16% mint leaf, 16% stalk and 68% vinegar, salt and colouring.

Mr. Malcolm Foster, a director of Mellors, said that in 20 years mint sauce had grown from a sideline to the company's main product. He pointed out that a normal day's production involved about a million stems which would mean 12 million or more leaves. Even if it were possible to hand-pick these, the production cost would be so high that the product would be prohibitively expensive.

The case was dismissed.

ERECTIONS AND EXTENSIONS

A new extension has been erected at **Miloko Chocolate Crumb Factory,** Carrick-on-Suir, Eire.

*

New extensions are planned to their factory in Pasture Road, Moreton, near Wallasey, by **Cadbury Bros. Ltd.**

*

Dublin Pure Ice and Cold Storage Co. Ltd., Mill Street, Dublin, Eire, have opened a new £35,000 extension to their cold storage depot at Scotch Quay, Waterford.

*

Sungold Products Ltd., St. Lawrence Road, Newcastle, are planning the construction of a new factory and cold storage building on a site at Beach Street and Gill Street, Newcastle.

*

Surrey Federal Bakery have submitted plans for the early erection of a two-floor extension to their premises in College Road, Guildford, Surrey.

*

North Tyneside Co-operative Bakeries Ltd. have had plans prepared to carry out extensions to their bakery in Norham Road, Tynemouth.

*

Ulster Meats Ltd., Bridge Street, Portadown, N. Ireland, have had plans approved for the erection of a new meat packing factory at Ahorey, Armagh, N. Ireland.

*

Kraft Food Products Ltd., 8, West Smithfield, London, E.C.1, are seeking permission to erect a new building on a one-acre site at New Addington Industrial Estate, Croydon, Surrey.

*

Danish Bacon Co. Ltd. are to construct a new food warehouse at King Henry's Drive, Croydon, Surrey.

*

Co-operative Wholesale Society Ltd. plan to construct a new mineral water factory at Tirpenry Street, Morriston, Swansea, South Wales.

*

British Fish Canners have completed negotiations with Whitstable Urban Council for the establishment of a new canning factory near Whitstable Harbour, Kent.

*

The Metal Box Co. Ltd. are negotiating the purchase of nearly 12 acres of land in Rochester for the erection of a processed food can factory. Building will commence shortly. When completed, the factory will be equipped with six automatic can-making lines, and ancillary equipment. Provision has also been made for the installation of additional lines as and when required. The factory will employ between 450 and 500 people on double shift working. The factory is planned to be in operation in 1957. When completed and fully equipped it will cost approximately £1 million and will consume some 40,000 tons of tinplate per year.

*

Extensions have been completed to the premises of **Unicream Ltd.,** Broughton Lane, Manchester. The work comprises an extension to the main canning room by the addition of a single-storey building on the roof of the existing factory. The new building provides a beginning to the canning line, houses the empty cans, and various packages, and allows for the gravity feeding of cans to the machinery in the canning room below.

Bulk sugar plant for Greenock

A scheme for the installation of bulk sugar handling plant and machinery in Greenock has been announced by Mr. Hugh Walker, a director of John Walker and Co. Ltd, the Greenock sugar refiners. At present London and Liverpool are the only British ports equipped for handling bulk sugar. There are three large sugar refineries in Greenock whose supplies of raw sugar are shipped in bags.

Under the scheme, three cranes will be set up at the James Watt Dock with grabs capable of lifting 5 tons at a time, each being served by a 10-ton hopper. Six ships are being built for a new company called the Sugar Line Ltd, each capable of carrying bulk sugar.

Mr. Walker said that the scheme would involve more than £180,000 worth of plant and machinery. His firm is interested in the formation of a new subsidiary company, the Greenock Bulk Handling Co. Ltd., which would operate and own the new plant.

Ice rink into food factory

The Grimsby Ice Rink in Ladysmith Road has been bought by Berkeley Hygienic Food Products, Grimsby, and will be converted into a food factory. It will employ between 150 and 200 people. The firm now employs about 100 workers.

The firm's manager, Mr. C. E. Burkitt, said that they would be taking possession and starting alterations immediately. "We manufacture crisps and our present premises in Riby Street have become inadequate to cope with the increasing demand," he said. "We are planning to turn out our first products from Ladysmith Road next January and hope to increase our output to 750,000 packets a week. The plant we shall be installing will be fully automatic. We also intend to go into the nut business as soon as we get our new premises ready and are planning big extensions to the existing buildings. All our plans are prepared and we have received planning consent to use the premises as a food factory."

More ice cream for west country

Two new ice-cream depots have been opened at Yeovil and Taunton by T. Wall and Sons (Ice Cream) Ltd. They now provide a much-improved service in an area of over 300,000 people.

Both depots are equipped with the latest type of cold store, kept at a temperature of −15° F. and both have a capacity for storing 2,500 cans of ice cream.

The new Yeovil depot, at Lyle Road, will serve an area with an estimated population of 140,000 people, and covers, in addition to Yeovil, the towns of Sherborne, Wincanton, Gillingham, Castle Carey, Crewkerne, Axminster and Lyme Regis.

The Taunton depot is at Priory Bridge Road, and covers Wellington, Bridgwater, Glastonbury, Burnham and Highbridge—approximately 165,000 people.

Packer-to-customer poultry plant

Egg testing, plucking, processing and packing are among the processes to be carried out at a poultry packing plant opened by Gordon Mackie of Aberdeen. The plant is designed to take delivery of eggs, live birds and other products at one end and deliver the finished product at the other. Plastic air-tight bags are used to pack birds for individual customers.

Meat plant for Yugoslavia

Meat processing and abattoir plant have been ordered from British firms following visits from a Yugoslav purchasing mission. Industrial Waste Eliminators Ltd. have received an £80,000 order for abattoir and bacon factory equipment, mostly of standard design, though some special units will be supplied. Equipment ordered includes cattle and sheep viscera inspection tables, pig de-hairing machines, pig and sheep head splitters, foot washers, conveyors, runway components, singeing furnaces and back scrapers.

Meat processing machines worth £17,000 have been ordered from the Morton Machine Co. of Wishaw.

COMPANY PROFITS AND PROSPECTS

New bottling factory planned

The chairman of Friary Holroyd and Healy's Breweries Ltd. reports that some 50% of their total barrelage is now in bottled beers and in consequence the company has decided to build a new bottling factory at Guildford. It will cost about £250,000.

Net profit for the year was £113,227. A final dividend of 9% was approved making 13% for the year.

*

Beer profits increase

Increased trade, both of beer in cask and more particularly of bottled beers, has increased the trading profit of Wilson and Walker Breweries Ltd. to £848,703 compared with £809,655 in the previous year. The net profit was £233,063 (£189,295). Work on conversions and extensions to the company's property is continuing. A new garage for the main fleet of lorries and the motor repair department are practically finished.

It is intended to wind up Walker and Homfrays Ltd. and the Manchester Brewery Co. Ltd. as soon as their respective liabilities for tax are settled.

*

Bovril's better year

The highlights of Lord Luke's address to shareholders at the annual meeting of Bovril Ltd. were: sales of their main product *Bovril* have improved, corned beef marketing has been freed, their recently acquired *Jaffajuce* products have had a successful trial period, and supplies and sales of *Ambrosia* creamed rice, which Bovril handled as selling agents, have increased.

The company are mechanising production still further by installing automatic machinery. They have installed at Old Street, London, a new production line for *Jaffajuce*.

For several years the meat industry in Argentina has been on a very unsatisfactory basis. Negotiations are proceeding to improve matters but in the meantime the company's factory is operating at a large loss.

The trading profit amounted to £799,000, an increase of £43,000 over the previous year. The group's net profit for the year was £342,000.

*

Vitamins profits double

Group trading profits have more than doubled over the past year, announced the chairman of the Vitamins Group at the annual meeting recently. The profit for 1954-55 was £181,330 compared with £87,123. Profit after taxation was £92,928 (£41,296). The year saw the development of Vitamealo *Supercon* products for animal feedingstuffs, which have been designed to supplement the cereal grain and protein sources commonly used by animal food compounders in making up livestock rations. The factory at Keynsham for the West of England and South Wales trade in *Vitameal* is nearing completion.

*

Competition in cakes

Last year was described as moderately successful by the chairman of William Melhuish (Proprietors) Ltd. The net profit of £34,686 was slightly down on 1953 (£35,955). Demand for cake products produced by Harris Cakes Ltd., and Melhuish Cakes Ltd., developed steadily but competition intensified. Disappointing results were obtained from the potato crisps department of W. Melhuish Ltd., which were believed to be due to the bad summer. The small sweet manufacturing business acquired by the company in the early part of the year traded most successfully.

*

New sugar plants cost £9 m.

Completion of their five-year programme of plant modernisation at a cost of £9·2 million was announced by Sir Alan Saunders, chairman of the British Sugar Corporation Ltd., in his statement for 1954-55. He said: "The major plant additions (in this last year of the reconstruction programme) were ten continuous diffusers installed in six factories. These operated very satisfactorily and were the primary reason for the achievement of a record low sugar loss in process.

"Total sugar produced was 596,601 tons, of which 367,056 tons was white sugar. The amount of sugar beet pulp produced was 279,226 tons. Molasses production amounted to 199,096 tons."

*

£3½ m.-worth of potato crisps

Smith's Potato Crisps' output and sales made another record in the year ended last March. Turnover of the crisp company alone reached an annual rate of more than £3½ million. The net group profit for the year was £214,138 after tax (£141,575). The increase would have been larger but for the shortage of potatoes in the last four months of the year.

Mr. F. Le Neve-Foster, the chairman, reported that a new factory at Paulsgrove, near Portsmouth, was completed last autumn and is now in part production. It is thought to be a classic example of what a modern food factory should be. A factory at Ashford, Kent, has been completed, and a new factory in Newcastle is being built. The new depot near Edinburgh has been completed.

Plea for canning code of practice

A strong plea for a code of practice for the British canning industry was made by Lt.-Col. Maurice W. Batchelor when he opened the annual sales conference of Batchelors Peas Ltd. at the Palace Hotel, Southport, on Thursday, August 18.

"I think," he said, "it is absolutely essential that regulation weights, standards and fills should be laid down for the canning industry in this country."

Col. Batchelor went on to say that he was a member of a committee working to achieve this end and within the next 12 months it was expected that all canners would be packing on the same basis. It was hoped that when these standards had been properly fixed and agreed the Board of Trade would sanction them and consider making them into statutory regulations which would soon have to be properly enforced.

In his review of the year, Col. Batchelor said that 1954 had proved to be an all-time record for the company.

Standard for milk bottle crates

A British standard for crates for one-pint and one-quart milk bottles (B.S. 2611:1955) has been issued. It deals primarily with the dimensions of milk bottle crates made either of metal strip sections, or of wire, to hold 20 (5×4) one-pint bottles, or 12 (3×4) one-quart bottles. In view of the increasing use of crating and de-crating machinery, due consideration was given to the dimensions of the bottle pockets in relation to the sizes of milk bottles specified in a British standard to be published under the title "Milk bottles of the aluminium cap type."

B.S. 2611 may be obtained from the British Standards Institution, 2, Park Street, London, W.1 (2s.).

Works safety at Batchelors

Their first Works Safety Week was recently held at the Batchelor's Peas Ltd. factory at Wadsley Bridge, Sheffield, which employs some 1,800 people. The scheme, which was evolved after considerable research among other companies who have held similar events, took the form of competitions, with an exhibition of the types of hazards likely to arise in the factory. A feature of the exhibition was a display of the correct dress for employees in a food factory.

Tomato ketchup returns

Crosse and Blackwell Ltd. have reintroduced their formerly well-known tomato ketchup which is made to an old French recipe.

Food News Overseas

Irish flour order

The use of flour subsidised by the Irish Government for making cakes and biscuits has been forbidden under a government order which makes it illegal for manufacturers to use other than special flour made at an extraction rate of 72% which will be sold from the mills at 130s. per sack.

Meat agreement review

Australia has completed arrangements with the British Government for annual review of the 15-year meat agreement, announced the Minister of Commerce recently. Minimum prices of beef, lamb and mutton are being considered. Under the new arrangement the long-term agreement can be reviewed annually if in the opinion of either Government it is failing in its purpose.

Meat producers throughout Victoria have had a record year according to the chairman of the meat committee of the Australian Primary Producers' Union. The prices to producers of all meat—particularly lamb and with the exception of pigmeat—were satisfactory. The committee is planning the formation of an Australian meat producers' board. The present board only deals with export meat which comes to about one-fifth of the total production.

More sugar factories for India

Dr. Panjabrao Deshmukh, Union Agriculture Minister, said recently that the Indian Government had licensed the construction of 21 new sugar factories to deal with the country's increasing output of cane sugar.

Two of the factories, estimated to cost about Rs. 7·5 million each, are to be set up on a co-operative basis. Sugar cane growers are to contribute about Rs. 1 million to Rs. 1·5 million of the capital required for each factory and the State Governments concerned would contribute an equal amount. The balance of Rs. 3 million or Rs. 4 million is to be provided by the Industrial Finance Corporation. One of the factories is to be located in P.E.P.S.U., and the other in the south, probably in Bombay State.

Up to last May sugar production had totalled 1,567 million tons, and with 31 factories still crushing, the final output was expected to reach 1·6 million tons. This all-time record crop exceeds the previous record in 1951-52 by 100,000 tons and last year's production by 600,000 tons, although the acreage of sugar cane remained the same at 3·6 million acres. This increased output of 20% per acre is attributed to the more generous use of such fertilisers as ammonium sulphate, following the drive launched by the Ministry of Agriculture last year.

By the time the new sugar factories come into operation in two or three years output is expected to have reached more than two million tons a year.

The Minister of Agriculture said that by November 1 there would be an expected stock of about 800,000 tons of sugar left for carry-over.

U.S. eats more pork

Increased pork consumption in the United States will send the 1955 *per capita* consumption of meat to 158 lb. according to a U.S. Department of Agriculture estimate. The figure is a 3% increase over 1954 and the highest for 40 years.

Although more beef than pork is still being eaten per person, the Department estimates that individual consumption of beef will be about 78 lb., just below last year's record of 79 lb. Veal will be eaten at about the same rate as last year—10 lb. per person—while lamb consumption is expected to drop from 4·5 to 4·2 lb.

Modern meat plant for Nicaragua

Nicaragua's first modern slaughterhouse and meat chilling plant, at Managua, is being built jointly by the Institute of National Development and the Ministry of the National District. Initially the plant will be able to handle 30 cattle and 75 hogs per hr. Cooler space is to be provided for 360 cattle and 450 hogs.

It is hoped that the new factory will make it possible to export meat products and packing-house by-products.

Simple coffee separation

The process of separating the outer part of the coffee berry from the inner beans has been simplified by eliminating a long fermentation period by means of a new machine invented in Guatemala by two American technicians. The machine is called the "Cafepro" and it consists of a compartmented trough in which the beans are washed in alkaline solution of wood, ash and lime. This is said to free the beans in 3 min. whereas older methods required 12-15 hr.

Gift of dairy plant

The first consignment of Rs. 2·6 million worth of dairy equipment arrived recently in Bombay from New Zealand. It is a gift from New Zealand under the Colombo Plan and will be used at the Dairy Farm in Anand (Bombay State).

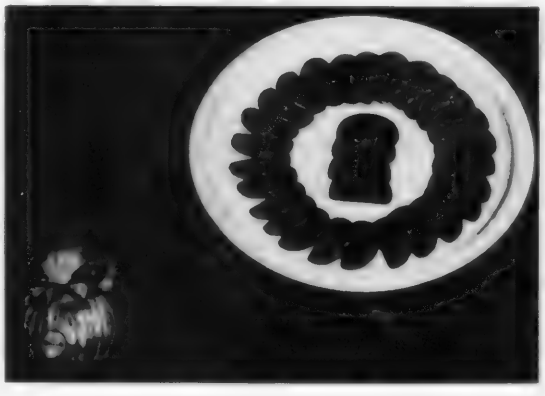
Meat colour studies

Colour in fresh and cured meat products is being investigated by the American Meat Institute Foundation, Chicago. The research programme has been designed to provide information on the basic chemistry and chemical behaviour of the compounds responsible for the colour of meat. It is expected that this information, when related to the stability of the colour of fresh and cured meat on exposure to air and light or to the influence of ascorbic acid and other additives, will help solve many problems and may aid in the development of improved handling, processing and distributive processes.

The first reports have been published in the technical press and reprints are available from Dr. H. R. Kraybill, vice-president and director of research of the Foundation.

Chocolate Tangerines

A new type of chocolate has been brought out by Drost of Haarlem. It consists of chocolate "tangerines" weighing 3½ oz. and made of tangerine flavoured milk chocolate. When the tangerine is tapped on a plate it splits up into 30 slices.



Fruit canning for Mysore

The establishment of a fruit canning concern in Mysore has been recommended by the Committee on Industries to the Indian Government. The concern is to be on a joint-stock basis, with an authorised capital of Rs. 2 million. The Mysore Government is expected to take shares to the extent of Rs. 200,000 out of a total issued capital of Rs. 445,000. Cheap electric power and other facilities will be given.

Surplus milk problems

New milk producers should be warned against the dangers of relying too much on pasteurisation and similar processes, rather than producing a better quality milk in the first place, declared M. Louis Maire at the F.A.O. Council studying surplus disposal problems. The paramount necessity for increasing milk consumption, especially in countries where there is at present no large or organised dairy industry, was emphasised by several delegates. The Pakistani delegate pointed the need to improve dairying within such countries by building up local herds. So far from reducing imports of dairy products this should stimulate interest among people not previously able to afford milk, and actually increase consumption of imported products.

Swift centennial

In 1855 G. Franklin Swift, the 16-year-old son of a struggling Cape Cod farmer of English forebears, borrowed 20 dollars from his father and bought a heifer, which he killed and dressed, then peddled the meat from door to door in the Massachusetts townships of Barnstaple, Dennis, Falmouth and Chatham. This was the humble beginning of the great firm of Swift and Co., wholesalers and importers.

The company young Swift founded now sells an average of 50 million dollars' worth of products each week, mainly in the United States, where today there are nearly 3,300 meat packers competing vigorously to supply 165 million consumers with more than 65 million pounds of processed products daily.

OVERSEAS ENQUIRIES

Canada: coatings and cocoa powder

Mr. K. T. Beck, general manager of Davies, Irwin, Ltd., 121, Bates Road, Outremont, Montreal 8, P.Q., is interested in representing British *manufacturers* of chocolate coating, compound coating, cocoa powder and fruit pulp.

Davies, Irwin, Ltd., who were established in 1911, are a firm of manufacturers' agents and wholesalers. They already represent a number of United Kingdom manufacturers throughout Canada for a variety of products. They are considered to be a suitable connection for U.K. firms.

Interested manufacturers should write direct to Mr. Beck, at the same time notifying the U.K. Trade Commissioner, 1111, Beaver Hall Hill, Montreal, that they have done so.

*

Trinidad: foodstuffs

Empire Sales and Agencies Ltd., P.O. Box 317, Corner of St. Vincent Street and Tragarete Road, Port of Spain, Trinidad, wish to represent British manufacturers of:

Dairy products, pulse and grain products, fish, meat, onions and garlic.

They are considered to be a suitable connection for United Kingdom firms.

Interested manufacturers should write direct to the Trinidad firm, at the same time notifying the U.K. Trade Commissioner, Colonial Building, South Quay, (P.O. Box 225), Port of Spain, Trinidad, that they have done so.

Peru: fish meal factory

The firm of Exportadora El Sol S.A., Edificio Beytia 412, Apartado 2404, Lima, plan to establish a fish meal factory and wish to receive offers, from British firms, for a second-hand plant using centrifuge equipment, burning petroleum and with a capacity of five tons of raw fish per day. The equipment should be ready for immediate shipment.

Interested suppliers should write direct to Exportadora El Sol S.A., quoting prices in U.S. currency, and notifying the Commercial Secretariat, British Embassy, 5th Floor, Edificio Republica, Paseo de la Republica III, Lima, that they have done so.

*

Canada: brewing and bottling supplies

The Paul Moore Co. Ltd., 1260, Hamilton Street, Vancouver, B.C., are interested in representing British suppliers of the following lines for the brewing and bottling trade:

Aluminium beer kegs, crown bottle openers, hose clamps, rigid plastics tubing, shrink-on bands for the necks of liquor bottles, bottle closures.

The Paul Moore Co. Ltd. are manufacturers and dealers in brewery, bottling and food plant equipment and supplies. They are considered to be a suitable connection for British firms.

Interested exporters should write direct to the Paul Moore Co. Ltd., at the same time notifying the U.K. Trade Commissioner, 540, Burrard Street, Vancouver, B.C.

Booklets Received

★Details of their floodlights, hoarding reflectors and other outdoor illumination equipment are given by Benjamin Electric Ltd. in their new Outdoor Catalogue No. 2520.

*

★Protective clothing in polyvinyl chloride is described in a series of leaflets produced by James North and Sons Ltd. There are separate leaflets for white clothing, aprons, headgear, chemical-resistant clothing and gloves.

*

★The multifarious uses of *Cellophane* are featured in a new 70-page book published by British Cellophane Ltd. At least 15 types are used for packaging, and other uses include cellulose adhesive tapes, seamed tubing for sausage casings and drinking straws. The physical properties of the film, packaging forms, means of closure and the use of wrapping machines are discussed.

*

★The care and handling of meat pies is dealt with in a bulletin issued by T. Wall and Sons (Meat Products) Ltd. and intended particularly for retailers. The bulletin, which is a revised edition of an earlier publication, contains information on stocking, handling, storage and wrapping of pies, as well as dealing with stock rotation, counter and window displays and the correct cutting of large pies.

*

★Renold Chains Ltd. have published a new booklet dealing with the use of precision chains for purposes other than power transmission. The very wide variety of devices, motions and operations for which chains and their attachments can be used to provide the basic mechanism make it necessary to restrict the booklet to basic operations. The booklet is externally indexed and gives information on 20 applications.

*

★Pneumatic grain conveying, pneumatic dust collecting and laboratory machinery are the subjects of three revised publications issued by the Sturtevant Engineering Co. Ltd., to supersede former editions which are now out of print. Grain conveyors in a large granary are shown in the first of these leaflets, which also deals with in-bin drying plants and in-sack dryers. Tea packeting machines, and the rotary blenders and the receiving hoppers for sieving machines in a food factory equipped with dust exhausting plant are among the applications described for pneumatic dust collecting plant. This booklet also deals with pneumatic conveying. The laboratory machinery described includes mills, crushers, disintegrators, rotary dryers, paddle mixers, vibrating screens and separators.

Packaging

One-cup sugar packs

Individual "one-cup" packs of sugar—intended principally for self-service buffets—have been introduced by Tate and Lyle Ltd. The sugar is contained in transparent packs of moistureproof *Cellophane*, printed in blue with their brand-name, and hold sufficient sugar for one cup of tea or coffee. The pack, a "transwrap" type, is made on a Forgrove machine.

Yugoslavian packaging journal

A new monthly packaging journal—*Ambalaza*—is being published by the Yugoslav Association for Materials Protection and is believed to be the first of its kind in the Balkan countries. English, French and German summaries are carried. A typical issue gives information on the production of packaging materials in Yugoslavia, and carries articles on the applications of polyvinyl chloride, aerosol packs and display.

Polythene bags for bacon

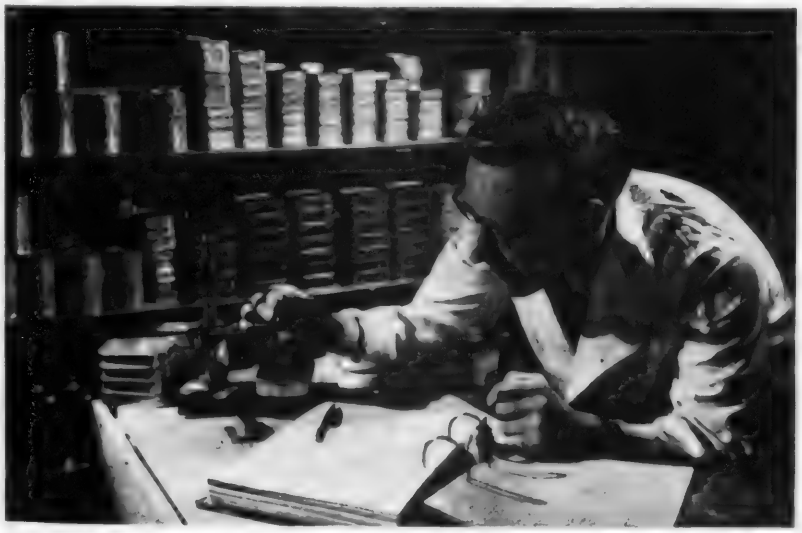
A new perforated polythene pack for wrapping sides and cuts of bacon has been marketed by the Hypack Division of Oppenheimer Casing Co. (U.K.) Ltd. The new hygienic wrap is reported to be superior to the widely used cotton netting which, besides attracting flies, offers insufficient protection against dirt during transit. The main advantages of this film pack over cotton netting are its transparency, toughness, facility in wrapping and its ability to protect the bacon and preserve its quality in transit. It is claimed to prevent loss of weight during distribution and to be sufficiently greaseproof to prevent bacon grease from staining clothing. Polythene is non-toxic, and gives protection against freezer-burn, the menace of deep-freezing.

Any size bag can be made to slip easily over individual sides and cuts of bacon or, if preferred, the wrap can be supplied in 100-ft. reels, enabling packers to cut and tie both ends of the bag themselves.

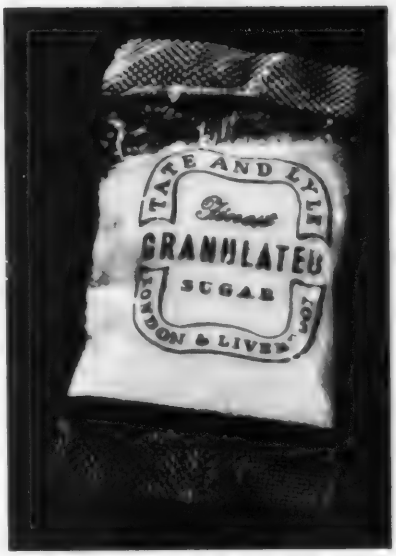
A polythene wrapping for bacon was introduced by British Visqueen Ltd. earlier this year (FOOD MANUFACTURE, February, p. 83).

Research on aluminium cans

The use of aluminium for seamless food and beverage containers is one of the many investigations being carried out at the Banbury premises of Aluminium Laboratories Limited on behalf of the Aluminium Limited group of companies.



The canning laboratory "hot store" at the Banbury premises of Aluminium Laboratories Ltd. Aluminium cans are stored at 95°F. and under these conditions any reaction between the can and its contents is about four times as rapid as at normal room temperature. The height of the can is measured at intervals, as shown. The change in height due to doming of the end as a result of internal pressure is an indication of the amount of corrosion which has taken place.



One-cup sugar pack in cellulose film.

Canning in aluminium is already established in some countries, notably Norway and Switzerland, and has been used to a limited extent in other countries, including the U.K. It is the belief of the aluminium industry that canning represents an important future outlet for the metal and consequently much attention is being devoted to fundamental studies of the use of aluminium for this type of packaging.

The investigations at Banbury cover all aspects of aluminium canning from the production of metal for can manufacture to the testing of the final packed product. The experimental equipment available includes presses for the manufacture of deep and shallow cans, high speed degreasing machinery, lacquering and stoving plant, seaming machines and autoclaves. Facilities are also available for the testing of shelf life in storage rooms at different temperatures.

Hams baked in their own pack

Hams wrapped in heavy foil jackets which can be used for baking are being sold by the W. F. Thiele Co. of Milwaukee. This is thought to be the first use by a meat packer of aluminium foil for this purpose.

The foil is printed in four-colour letterpress to give it an attractive and striking appearance. The company claims that when the ham is rewrapped in the foil and placed in a shallow pan, the natural juices and flavour are sealed in as it cooks and the pan is protected from drippings.

The hams are first wrapped in heavy rag-paper liners to retard the flow of grease, since heavy-gauge foil does not absorb moisture and would become unsightly without the inner wrapping. To cook a ham, it must be unwrapped, then sealed in the foil alone.

New Companies

Roy's Bakery, Ltd. (548956.) Coltishall, Norfolk. To take over business of bakers and confectioners carried on as "Roy's Bakery." £5,000. Permt. dirs.: Mrs. F. K. Roy, E. P. Roy, F. A. Roy and P. E. Roy.

William Field (Coffee), Ltd. (548977.) 58, Park Street, Southwark, London, S.E.1. Importers of and dealers in tea, coffee, cocoa, chicory, etc. £1,000. Dirs.: Mrs. J. M. and L. R. O. Norwood.

French Vineyards Produce (Wholesale), Ltd. (548999.) 1, Plowden Buildings, Middle Temple Lane, London, E.C.4. Dealers in and bottlers, distributors, manufacturers, brewers and distillers of wines, spirits, beers, etc. £20,000. Dirs.: to be appointed by subs. Subs.: C. M. Noel and K. J. Avery.

Happy Boy Products (Blackpool), Ltd. (549002.) Back Handsworth Road, Blackpool. Ice cream and water-ice makers and vendors, dairymen, soda fountain proprietors. £6,000. Dirs.: J. H. Sewell and H. Taylor.

Goodmans (Slaughterers), Ltd. (549036.) The Bungalow, Station Road, Ettington, nr. Stratford-on-Avon. £1,250. Dirs.: G. E. Goodman, W. A. Goodman and T. G. Goodman.

Northern Blending Co., Ltd. (549090.) 92, New Cavendish Street, London, W.1. Whisky blenders, wine, spirit and cider merchants, shippers, etc. £5,000. Permt. dirs.: B. R. A. Burke and H. W. H. Paul.

Gordon Johnson - Stephens, Ltd. (549144.) Dealers in machinery, implements and equipment used for plucking, eviscerating, dressing and preparing chickens and other poultry. £5,000. Dirs.: G. Johnson and J. D. Williamson, R. J. Stephenson and B. F. Stephens. Subs.: F. Williamson and G. P. G. McNair (solrs.), 5, Thavies Inn, London, E.C.1.

Harry Platt (Confectioners), Ltd. (549146.) 35-37, Church Street, Atherton, Lancs. Bakers and confectioners. £1,000. Dirs.: H. and Mrs. H. Platt.

Henry Duckworth, Ltd. (549150.) 38-9, Central Market, London, E.C.1. To take over business of H. Duckworth and Son carried on by Harold E. Gunner as surviving partner at Central Markets, London,E.C.1, of importers, buyers and sellers of meat, as butchers, etc. £10,000. Permt. dirs.: H. E. and Mrs. I. E. Gunner.

Laura (Coventry), Ltd. (549230.) 2, Queens Road, Coventry. Manufacturers of and dealers in confectionery, chocolates, sweets, ices, etc. £500. Dirs.: Laura E. E. and Lena Panico.

Armstrong and Co. (Bootle), Ltd. (548222.) 225, Stanley Road, Bootle, Lancs. Bakers and confectioners, etc. £5,000. Permt. dirs.: J. P. Hallett and Kathleen H. Hallett, A. J. Hallett and J. P. Hallett.

Brandies of France, Ltd. (548226.) Room 150, 20, Copthall Avenue, London, E.C.2. Wine and spirit importers, and exporters, merchants, manufacturers and shippers, etc. £10,000. Dirs.: to be appointed by subs. Subs.: R. C. M. Nathan and A. R. Jabez-Smith.

From Jordan and Sons Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.

The Leonard Hill Technical Group this month

Atomics.—Report on the International Atomic Conference, Geneva, 1; The Dekatron in Nuclear Instrumentation; The Long-Term Aspect of Fission Product Disposal; British Equipment at Geneva, 2.

Manufacturing Chemist.—Adrenergic Inhibitors; Manufacture of Perfumery Chemicals, 3: The Cinnamic Series; New Laboratories for Water Pollution Research; Hecogenin Acetate Production; Italian Pharmaceutical Engineering; Progress Reports; Analytical Chemistry, Detergents and Detergency; Perfumery and Essential Oils.

Chemical and Process Engineering.—Bursting Discs; Multi-Stage Gas Washing; Heat Transfer; Chemical, Chemical Engineering and Mining Progress in South Africa.

Corrosion Technology.—Corrosion Research Laboratories, 5: The Battelle Memorial Institute; Staining of Engineering Components; Russian Ideas on Painting Machinery.

Fibres. — Industrial Uses of Artificial Fibres, 3; Polyacrylonitrile Fibres; Improved Glass Fibre Paper; Textile Microtechnique; Fibres made from Synthetic High Polymers.

World Crops.—Radiata Pine in Chile; Grazing Resources of Arid and Semi-Arid Lands; Developments in Western German Agriculture; Report on the Royal Show.

Dairy Engineering.—Advances in Dairy Refrigeration; Eight-ton Palletisation in the Cold Store; Tank Refrigeration by the Cold Wall Method; Insulating the Dairy Cold Store; Ice-Bank Milk Coating Plant; Dairying Developments in Cyprus, 2.

Petroleum. — Plant Calculations for Petroleum Technologists, 3: Heat Transmission; Lubricating Grease.

Paint Manufacture.—Solvents for Nitrocellulose Lacquers; Conjugation in Drying Oils; Fluorescence to Order; Fire Retardant Paints.

Building Materials. — Prestressed Steel; Towards the Glass Wall, 2; Types of Cellular Concrete.

Trade Marks

APPLICATIONS

CLOVER LEAF BRAND.—721,157. Canned fish, canned shellfish and frozen fish. **Columbia River Packers Association, Inc.** (a corporation under the laws of Oregon, U.S.A.), 252, Front Street, Astoria, Clatsop County, Oregon, U.S.A.; Manufacturers and merchants. Address for service is c/o H. D. Fitzpatrick and Co., 94, Hope Street, Glasgow, C.2.

COPELIA.—739,480. Port wine and sherry wine. **Martinez Gassiot and Co., Ltd.**, 5, Fenchurch Street, London, E.C.3.

CORELL.—B728,222. Fresh oranges. **Corell Hermanos,** Calle del Matematico 29, Valencia, Spain; Exporters. Address for service c/o J. E. Evans-Jackson and Co., 49, Albert Hall Mansions, Kensington Gore, London, S.W.7.

CORONELLE.—734,868. Canned fruits and canned meats. **Cradock Manners, Ltd.**, 4, Crowcross Street., Smithfield, London, E.C.1; Merchants.

COWAN'S TWIRLIES.—735,316. Sugar confectionery (not medicated) chocolates and chocolate. **Cowan's, Ltd.**, 49, Solway Street, Glasgow, S.E.; Manufacturers.

"CUTTY SARK."—737,151. Canned fish, canned meat, canned fruit and canned vegetables. **Henry L. Beale and Co., Ltd.**, 1, St. Dunstan's Lane, Eastcheap, London, E.C.3; Merchants.

DAVOTT.—739,449. Edible oils and edible fats. **Elliott, Davies, Ltd.**, 13, Blossom Street, Manchester, 4; Merchants.

DELROSA.—739,175. Rose hip syrup for making non-intoxicating, non-medicated beverages. **Scott and Turner, Ltd.**, Andrews House, Gallowgate, Newcastle-on-Tyne; Manufacturers.

"DOLLIPOPS."—738,151. Non-medicated sugar confectionery. **Robertson and Woodcock, Ltd.**, Trebor Works, Katherine Road, London, E.7; Manufacturers.

DUNBRO.—739,438. Sausages. **Duncan Bros. (Liverpool), Ltd.**, 2, Rose Street, Liverpool, 1; Merchants.

FAIRWAY.—738,553. Canned fruits. **Shepparton Fruit Preserving Co., Ltd.** (a joint stock company under the laws of Victoria, Australia), Archer Street, Shepparton, Victoria, Australia; Fruit preservers. Address for service c/o A. A. Thornton and Co., Napier House, 24-27, High Holborn, London, W.C.1.

FARINOCA.—722,782. Preparations of farina in the form of flakes or pearls for foods for human consumption. **N.V. W. A. Scholten's A.F.** (a limited liability company under the laws of the Netherlands), Groningen, Zuiderpark, Netherlands; Manufacturers and merchants. Address for service c/o W. P. Thompson and Co., 50, Lincoln's Inn Fields, London, W.C.2.

FLORIL. — B604,162. Yeast. **Norddeutsche Hefeindustrie A.G.** (a joint stock company under the laws of Germany), Wandsbeker Zollstrasse 59, Hamburg-Wandsbeck, Germany; Manufacturers and merchants. Address for service c/o H. D. Fitzpatrick and Co., 49, Chancery Lane, London, W.C.2.

RIO DEL MAR.—738,992. Dead fish, fruits, nuts and vegetables, all being preserved, dried or cooked and canned fruits. **Gomperts of California, Ltd.**, Chandos House, Buckingham Gate, London, S.W.1; Merchants.

Information and Advice

This Service is available to subscribers to Food Manufacture. If a stamped addressed envelope is enclosed replies will be sent by post, but enquiries cannot be answered by telephone.

Salmon paste

B.7573. *Could you give us a recipe for making salmon paste?* (Morley, Leeds)

We suggest this recipe as a basis for experiment:

	Parts
Canned pink salmon	141
Bacon fat	7·5
Finest rusk	20
Water*	30
Pepper	0·5
Mace	1
Colouring	as required

* *This may be soup stock or a 5% gelatin solution.*

The ingredients, except the rusk, are well mixed and passed through the fine plate of a mincing machine. The rusk, which has previously been mixed with water or soup stock, is added to the other ingredients, the whole intimately mixed and the homogeneous paste filled into jars sealed with a Phoenix cap. Sterilisation is carried out at 240°F. depending on the size of the pack.

Chow chow

B.7589. *Can you suggest a recipe for chow chow?* (London, W.2)

The following recipe can be used as a basis for experiment:

	lb.
Cut pickles	175
Cut cauliflower	50
Cut wax beans	20
Large cut onions	25
Green cut tomatoes	30

The above mix is soaked for 3-5 days in 5% white vinegar and is then covered with chow sauce. The recipe for this is:

White distilled vinegar, 4%	145 gal.
Yellow seed	90 lb.
Brown seed	20 lb.
Salt	24 lb.
Turmeric	5 lb.
Garlic	6 oz.
Tragacanth	4 lb.
Cinnamon, powdered	24 oz.
Clove, powdered	6 oz.
Ginger, powdered	6 oz.
Nutmeg	4 oz.
Cayenne pepper	16 oz.
Black pepper	12 oz.
White pepper	6 oz.

Production—180 gal.

Soak the tragacanth overnight before using. Arrowroot starch may be substituted for gum. West Indian starch gives the best results.

Information supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery and materials, and also general information as follows:

B.7537. *Suppliers of plastic buckets.* (Coleford, Glos.)

B.7538. *Recipe for French mustard.* (Redfern, N.S.W., Australia)

B.7539. *Suppliers of fresh arrowroot flour.* (Bombay)

B.7540. *Manufacturers of fish-cake making machinery.* (Aberdeen)

B.7542. *Formulae for baby foods containing starch or glucose.* (Baasrode-près-Anvers, Belgium)

B.7544. *Makers of ground almonds and icing sugar.* (Liverpool)

B.7545. *Manufacturers of equipment for making waffles.* (Dublin)

B.7547. *Advice on colouring continental type sausages.* (Glasgow)

B.7548. *Advice on canning whole chicken.* (Utrecht, Holland)

B.7550. *Machinery for polishing cereals.* (Belfast)

B.7551. *Manufacturers of deep-frozen complete meals.* (Belfast)

B.7552. *Temperature and humidity of cold storage room for chocolates.* (Bombay)

B.7553. *Literature on emulsions of lemon oil.* (Anvers, Belgium)

B.7555. *Method for making mustard powder.* (Bombay)

B.7557. *Name of adviser for whisky manufacture.* (Rio Grande, Brazil)

B.7558. *Splitting, grading and polishing lentils.* (Liverpool)

B.7559. *Suppliers of water-soluble tasteless fillers for foodstuffs.* (London, N.19)

B.7560. *Recipe for rich sweet biscuits.* (Melton Mowbray)

B.7561. *Method for making cube sugar.* (Bombay)

B.7563. *Manufacturers of corn-cutting machine.* (Osaka, Japan)

B.7565. *Stevioside sweetening agent.* (Copenhagen)

B.7566. *Sulphur dioxide as a sausage preservative* (Tankerton, Kent)

B.7567. *Making halva.* (Redfern, N.S.W., Australia)

B.7568. *Makers of biscuit packing machines.* (Montpelier, France)

B.7569. *Suppliers of gum chicle, balsam tolu, and oil of spearmint.* (Baasrod-pres-Anvers, Belgium)

B.7570. *Recipe for 36° Baumé syrup. Suppliers of chocolate neatwork and cocoa powder.* (Sheffield)

B.7571. *Suppliers of monosodium glutamate.* (Bombay)

B.7573. *Recipe for salmon paste.* (Leeds)

Recent Patents

COMPLETE SPECIFICATIONS ACCEPTED

732,983. W. Evans and Co. (Hereford and Devon), Ltd., and R. S. Potter. Manufacture of a base material for thick sauces.
732,991. G. Adlam and Sons, Ltd. Coppers for wort and other liquids.
733,104. Radiation, Ltd. Heat pumps and refrigerators.
733,150. Co - operative Wholesale Society, Ltd. Handling of bottles.
733,225. P. S. Jewell and J. G. T. King. Foodstuffs
733,161. B. W. Chambers. Apparatus for wrapping apples or similar articles.
733,201. J. Lyons and Co., Ltd., and A. Boon Preparation and cold storage of ice cream.
733,266. F. F. Hansen. Method and apparatus for sheeting and curling dough.
733,324. M. Ellis. Dispensing means for semi-fluid or pastry substances.
733,376. N.V. Octrooien-Maatschappij Activit. Purification of sugar solutions.
733,386. Kip, Inc. Packet for use in the brewing of coffee and method of making same.
733,437. Maatschappij Voor Kolenbewerking Stamicarbon N.V. Process for the recovery of starch from cereal grains.
733,654. Forsters Machine Co., Ltd. Machine for collating biscuits and similar thin articles for wrapping purposes.
733,860. A. J. S. Evans (Ciba, Ltd.). Process for brightening carbohydrates and foodstuffs containing them.
733,771. Corn Products Refining Co. Process for preparing starch derivatives and their products.
733,991. General Foods Corporation. Metallic containers.
734,037. S. Drum-Hanson. Method for degassing cream or similar liquid foods and apparatus for carrying out the method.
734,407. Brecknell, Munro and Rogers, Ltd.: Machines for moulding and wrapping plastic material such as butter.
734,499. Shellmar Products Corporation: Egg carton.
734,410. Baker Perkins, Ltd.: Biscuit stacking machines.
734,581. H. Metz: Process for producing diabetic food.
734,411. E. Fawcett, Ltd., and H. White: Machines for turning grain in malt production.
734,413. U.D. Engineering Co., Ltd., J. C. Taylor and R. S. P. Arber: Apparatus for transferring articles to or from crates and containers.
734,520. National Research Development Corporation: Production or treatment of substances for human and animal consumption.
734,543. British Metal Crates, Ltd.: Hand truck or carrier for bottle crates.
734,660. Soc. Du Surbouchage Astra: Bottle-capping machines.
734,568. M. M. Baker: Moulds or containers for making ice blocks, frozen confections, etc.
734,838. L. P. S. Dijian and C. M. J. M. Le Jamtel: Containers for articles made of fusible material such as chocolate.
734,804. H. G. Mitchell: Means for grading tomatoes for size.
734,891. I. M. Bruce-Gardyne: Fruit-grading apparatus.
735,184. Wallace and Tiernan Process Co.: Manufacturer of dough and baked products.
735,125. D. P. Toomey: Device for the prevention of greening of freshly killed poultry.
735,204. Wallace and Tiernan Process Co.: Testing of dough.
734,197. Minister of Supply: Process for the preservation of foodstuffs.
734,290 and 734,292. T. Wall and Sons, Ltd.: Methods of and apparatus for filling flowable substances into containers.
734,212. Thompson and Norris Manufacturing Co., Ltd.: Expendable boxes, cartons and like containers.
734,382. V. M. Lewis: Preparation of condiments.
737,496. H. Simon, Ltd.: Means for incorporating liquids in flour, mill stocks or other powdered foodstuffs.
737,685. M. E. Nicholls: Trays or containers for fruit, cakes and other articles.

ABSTRACTS OF BRITISH PATENTS

Coffee bags

Disposable bags containing comminuted coffee are made from woven nylon or similar synthetic fibres rendered chemically inert and tasteless. The packet is about 4½-in. sq., is porous and is filled to about 40-60% of its volume with coffee.—733,386. *Kip Inc.*

Nut-skinning machine

A novel method is described for removing skins from nuts without crushing or breaking them. The nuts are moved forward on an endless horizonal conveyor, but their forward movement is obstructed by a series of abutments arranged in reversely inclined directions across the conveyor. The nuts are rolled loosely against the conveyor and these abutments so that their skins slip off. The removed skins are carried along on the conveyor and removed independently of the nuts which follow along the final abutments to an exit.—732,930. *J. W. Gardner.*

Degassing or deodorising cream

Existing methods for the deodorisation of cream or similar liquid foods in which the liquid is heated to a high temperature and led into a vacuum tank so that it begins to boil, expelling vapour particles, have the drawback of being rather complicated and involving a great deal of work when the apparatus is disconnected for cleaning.

The present invention avoids this by heating the cream under a suitable overpressure, preferably to a temperature in the vicinity of but slightly below its boiling point, after which it is made to flow through a restricted opening into a tank or chamber at atmospheric pressure so that a sudden reduction in pressure occurs.—734,037. *S. Ørum-Hansen.*

Heat treatment of chocolate

This invention is concerned with the tempering of chocolate before casting or enrobing.

It is claimed to provide a process and apparatus for the continuous treatment of chocolate mass bringing it to the correct physical state of pouring. It is said to speed up production, economise on labour and save space.

The apparatus consists essentially of a container, an annular displacement pump, a heat exchange chamber and an outlet chamber.

Chocolate mass is held in the water-jacketed 2,000 lb. capacity container and stirred by a rotating arm. An outlet at the bottom of the container communicates with the inlet of an annular displacement pump. This communicates with a narrow cylindrical heat exchange chamber extending vertically above the pump.

The pump chamber is divided into a compression chamber and a suction chamber by two vanes, one driven and the other static. As a channel section in the pump rotates chocolate mass is drawn into the suction chamber, compressed between the two vanes and forced upwards into the heat exchange chamber. The pumping rate can be regulated.

The heat exchange chamber contains a scraper roll fitted with a series of inclined blades which not only scrape the walls of the chamber but force the chocolate upwards by continuous upward motion. Two independent water jackets surround the heat exchange chamber, both supplied with cold water to cool down the mass and bring about solidification of the cocoa fat crystals.

The upper end of the scraper roll extends into the top of a chamber head fitted with a hot water jacket to provide "post tempering" and "after tempering," the first tempering having been carried out in the container. This chamber communicates with the delivery passage, also jacketed, which terminates in a delivery outlet. This is a jacketed nozzle, the jacket communicating with that of the delivery passage. A sieve member is provided across the mouth of the nozzle which also contains a pulsator to assist the continuous discharge of the chocolate mass.

An important part of the invention is the supply of hot and cold water to the various water jackets, and their arrangement. The water jacket surrounding the chocolate container is connected to that surrounding the chamber head on top of the heat exchanger. A butterfly valve in the connecting passage provides differential temperature control.

The jackets surrounding the delivery passage and the nozzle are joined in a hot water system with a water jacket round the inlet pump.

The independent jackets round the heat exchanger are provided with cold water from a common pipe. Independent stopcocks and outlets enable the degree of cooling to be accurately controlled.—728,330. *Baker Perkins, Ltd.*

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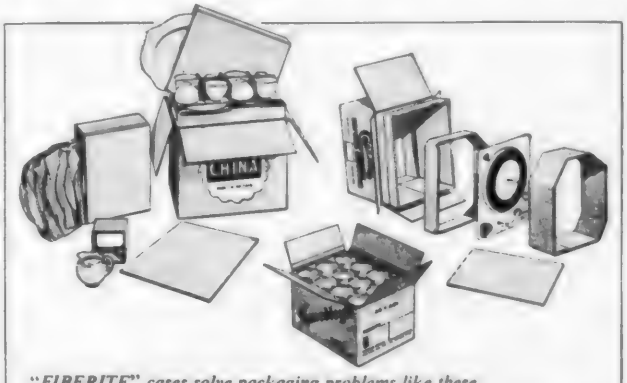

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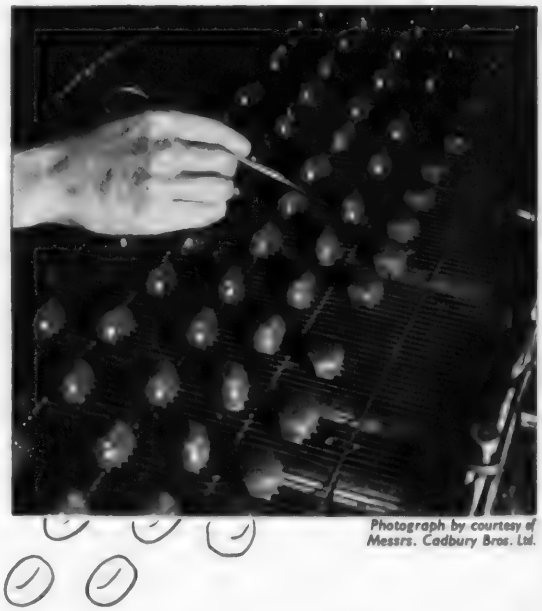

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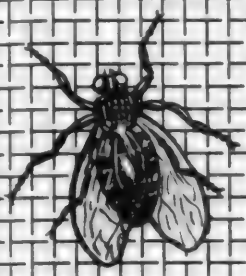

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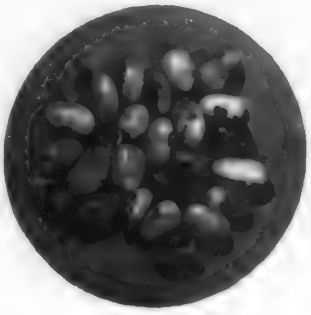

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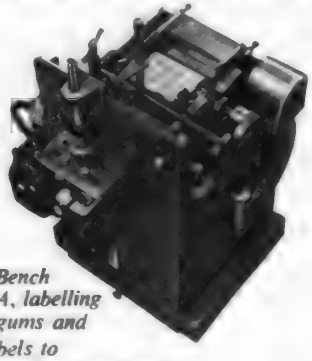
Patentees and Sole Makers *U.K. Patents No. 617276* *U.S.A. Patent No. 2536693 and other World Patents*

The name is NEWMAN



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The LOMA "METALTECTOR" has been designed for detecting the presence of either ferrous or non-ferrous metal in any non-metallic material and it can be arranged to stop the conveyor, mark or reject contaminated material. It can be applied to most products where the pack is non-metallic, otherwise detection can be arranged prior to the packing stage.

Here are four nationally known products for which the "METALTECTOR" is used, and from the variation of shape and volume it can be seen that the "search head" can be designed to any requirements.

In the last advertisement we showed a large jar of sweets, a small jar of pickles and a carton of macaroni and icing sugar

LOMA
ELECTRONIC EQUIPMENT
LIMITED
21-28 Union St. Southwark, London S.E.1
HOP 4295

Dickinson Self-Service packs are within your reach too. Printed in attractive designs, these transparent film packs available in ½-lb and 1-lb sizes, are ideally suitable for packing cereals, dried fruit, etc.

They bring you self-service packaging with an individual character, at a price that could not be obtained in any other way. Ask your usual supplier for details—you'll be surprised to learn how inexpensive Dickinson Self-Service packs are. In case of difficulty, write to :—

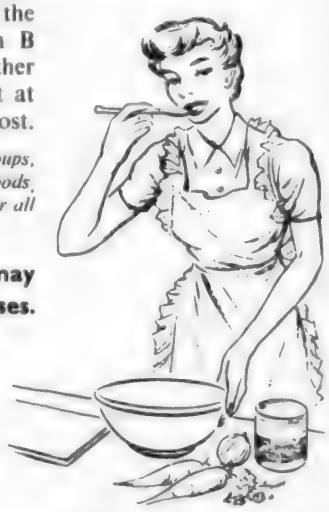
John Dickinson & Co. Ltd.

APSLEY MILLS, HEMEL HEMPSTEAD, HERTS.
Telephone: Boxmoor 124

PACKING BAGS FROM PAPER, FILM, FOIL, COTTON, PLIOFILM, POLYTHENE, LAMINATED MATERIALS, ETC. SEAL-EASI BAGS. POWDER POCKETS AND ENVELOPES. FILM, WAXED AND FOIL WRAPPINGS. SEMI-RIGID TRANSPARENT ACETATE CONTAINERS AND WINDOW CARTONS. KARRIER BAGS AND MILLINERY BAGS. HEAT SEALING, GUMMED OR UNGUMMED EMBOSSED SEALS AND LABELS. PACKWELL SEALING MACHINES. HOLDFAST GUMMED PAPER TAPES, GLUED AND THERMOPLASTIC STAY PAPERS. GUMMED AND HEAT SEAL LABEL PAPERS

More than a matter of taste . . .

Yestamin *does* improve the flavour of processed foods, but its most important attribute is nutritional, since it consists almost solely of protein and carbohydrates in association with vitamins and organic minerals. It is virtually fat free. Yestamin —pure, de-bittered, dried yeast—is one of the richest known sources of the complete vitamin B complex in its natural proportions. No other substance can effect greater dietary improvement at such low cost.



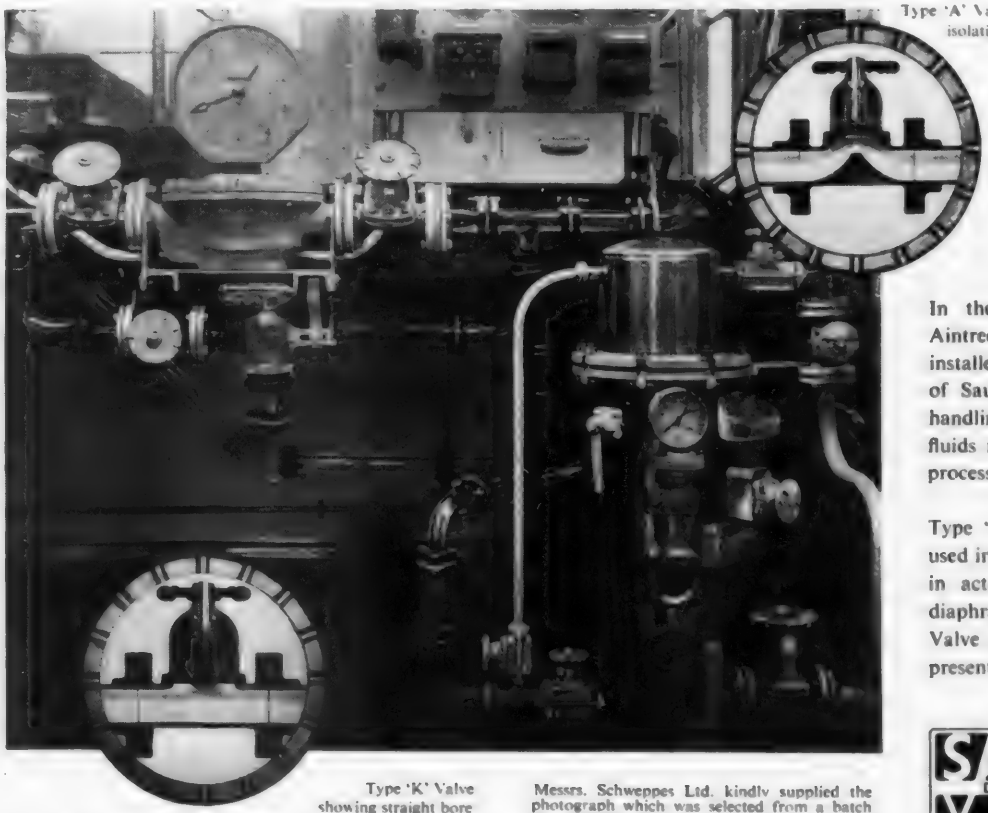
Yestamin is widely used in the food and pharmaceutical industries to enrich and fortify Soups, Stews, Beef Cubes, Meat Extracts, Savoury Biscuits, Invalid Foods, Tonic Beverages, Children's Foods, special products for nursing and expectant mothers, etc., etc., etc. Yestamin is specially suitable for all tonic preparations requiring the complete vitamin B complex in its natural proportions.

Free test samples are available to interested manufacturers who may be assured of our practical co-operation in any problem arising out of its uses.

YESTAMIN

PROCESSED YEAST

THE ENGLISH GRAINS CO. LTD., SHOBNALL ROAD, BURTON-ON-TRENT



Type 'A' Valve showing complete isolation of mechanism

Type 'K' Valve showing straight bore for not-so-fluid fluids.

Messrs. Schweppes Ltd. kindly supplied the photograph which was selected from a batch showing the extent and variety of the Saunders Valve installation.

Edible fluids hygienically handled

In their Soft Drinks Factory at Aintree, Messrs. Schweppes Ltd. have installed the sure and hygienic control of Saunders Diaphragm Valves for handling syrups, fruit juices and the fluids involved in the manufacturing processes.

Type 'A' and Type 'K' Valves are used in this installation. All are sure in action and in inaction, for the diaphragm closure of the Saunders Valve is perfect even when pips are present in the fluids.

SAUNDERS DIAPHRAGM VALVES

SAUNDERS VALVE COMPANY LIMITED · · · DIAPHRAGM VALVE DIVISION · CWMBRAN · MONMOUTHSHIRE

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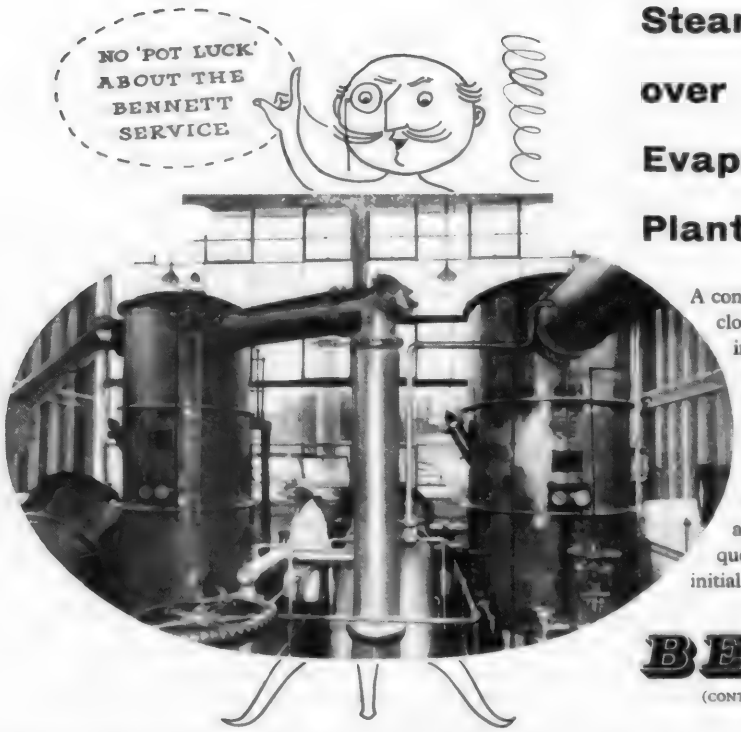

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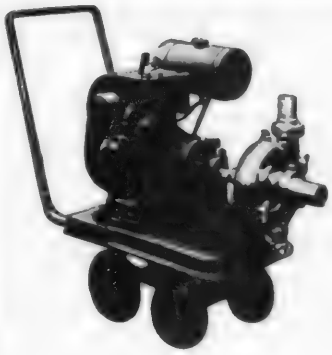

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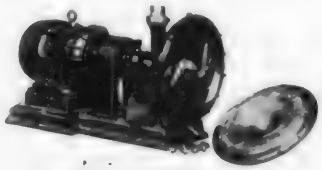
'Morton' Centrifugal Pumping set Capacities up to 37,000 G.P.H. Heads up to 160 ft.



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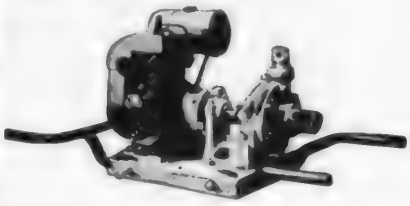

'Morton' Portable Pumps
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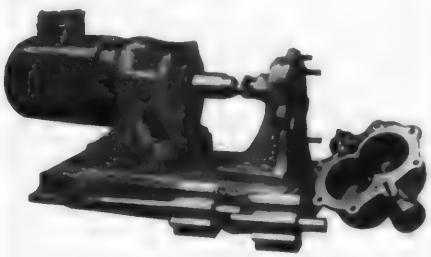
'Morton' Motor Driven Rotary Pump dismantled for cleaning.



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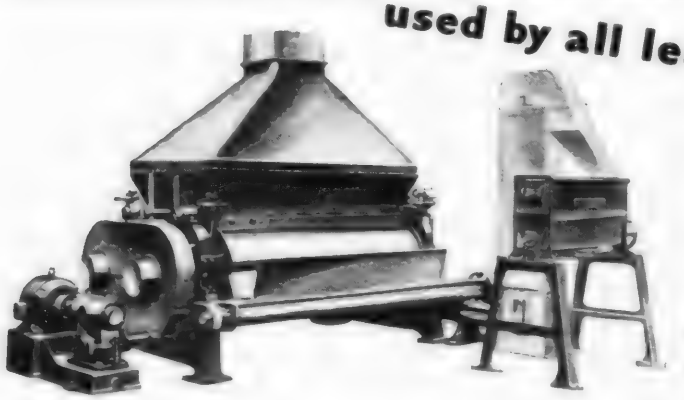

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Made in four sizes with drying capacities of 10 12 gallons per hour (for the laboratory and small scale production) to 250 300 gallons per hour. Can be arranged in batteries of 2, 3 or 4 machines, with common cross conveyor, elevator and sifter, driven independently.

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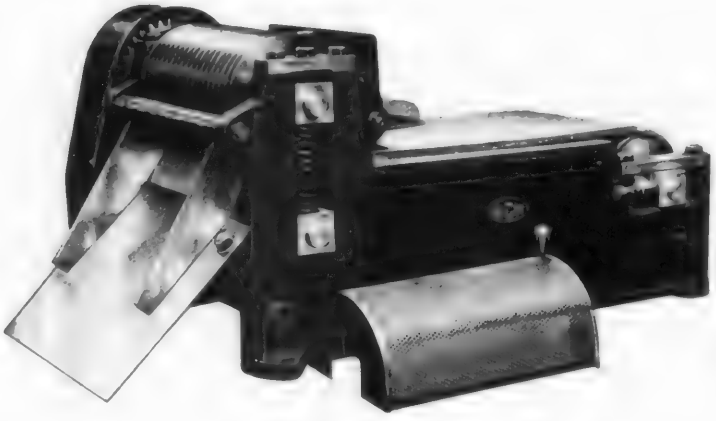

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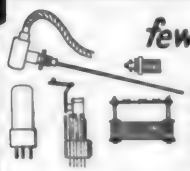
Here is a simple, compact device that gives immediate indication when the contents of a container have reached a set level. In addition to its visual warning, the TEKTOR can be connected to any circuit to sound an alarm, operate a stop switch or control the equipment feeding the container.

few components



A dipstick and co-axial cable, together with the compactly housed transformer, valve, relay and condenser are the only components. No flaps, floats or moving parts!

controls solids or liquids

Milk, fruit juices, beverages, sugar, fats, starch, tea, coffee, flour, cereals, currants, nuts, oils, etc. can be electrically controlled by the TEKTOR.

fits any container

Bins, vats or trays of almost any shape and size can be fitted. The TEKTOR dipstick merely needs a ½" hole; the unit housing (approx. 7" square and 4" deep) is mounted anywhere nearby. Remote control can easily be arranged.

costs ·01s penny an hr. to run

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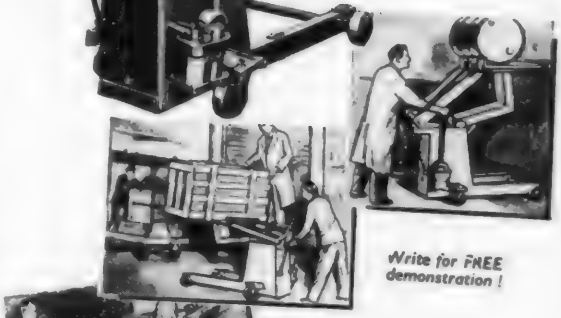

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A Can Opener that can open

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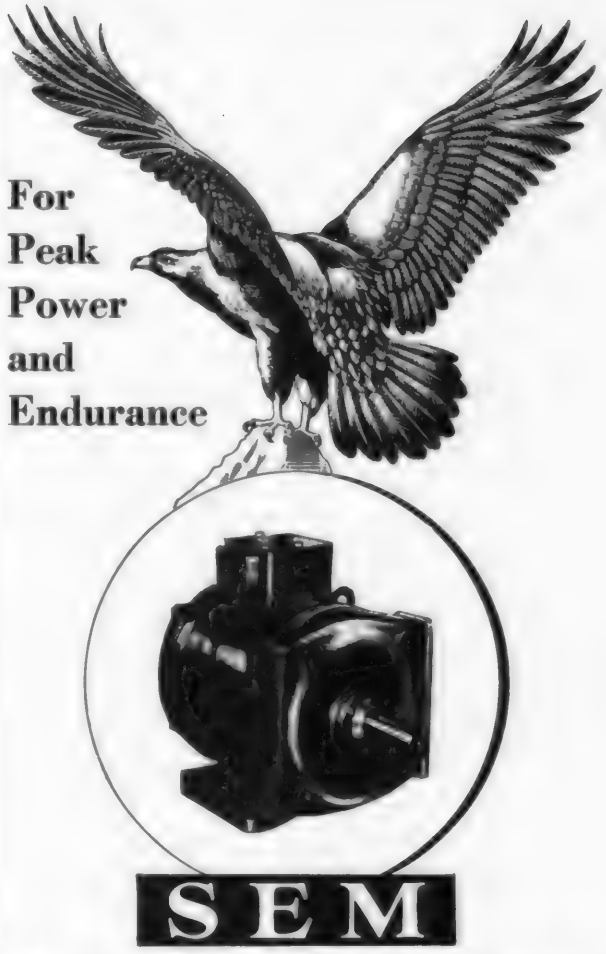

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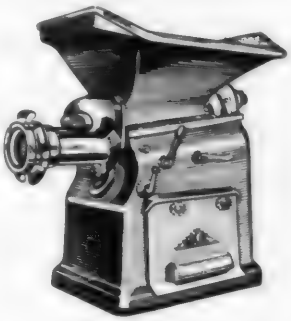

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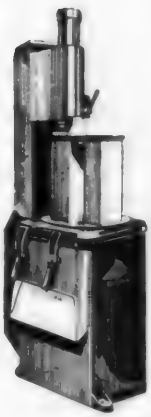

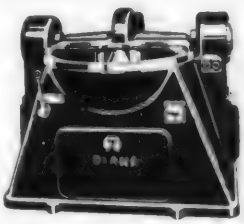

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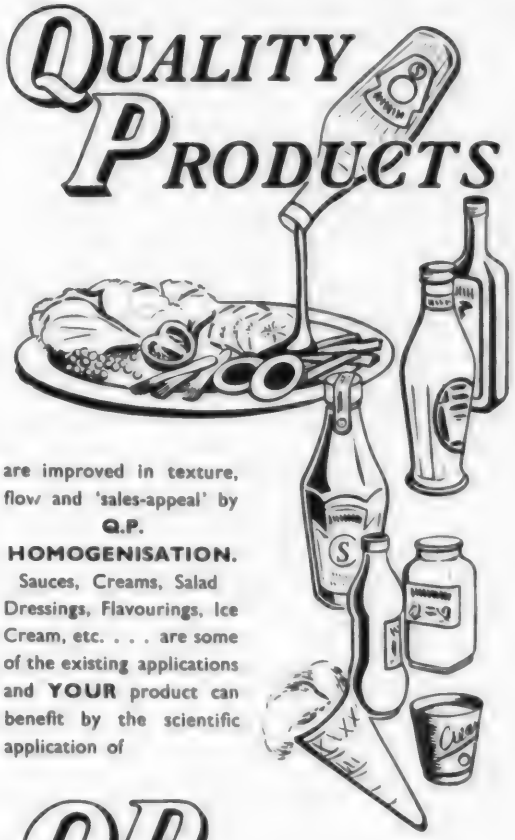

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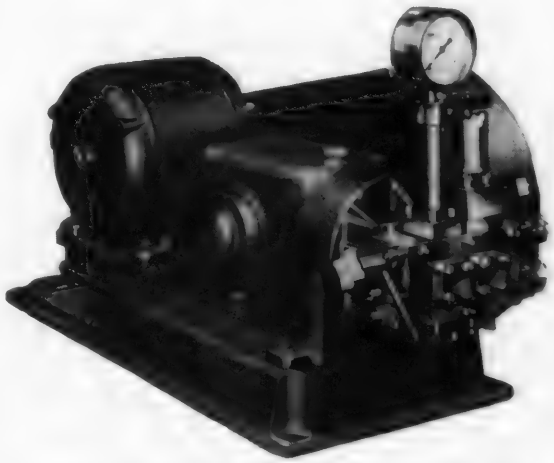

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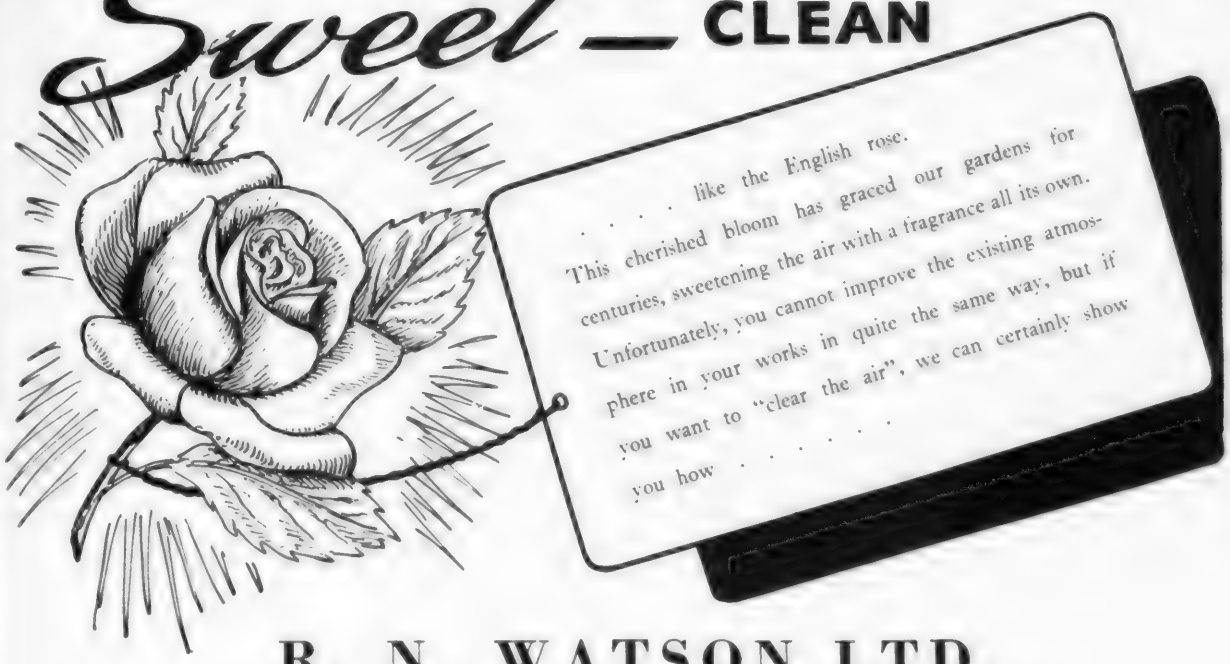
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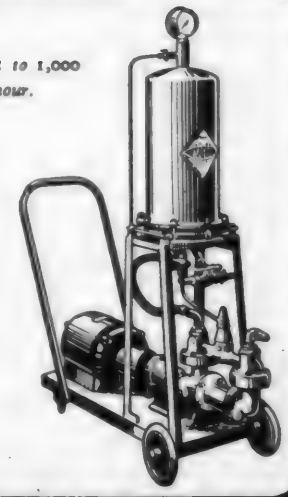

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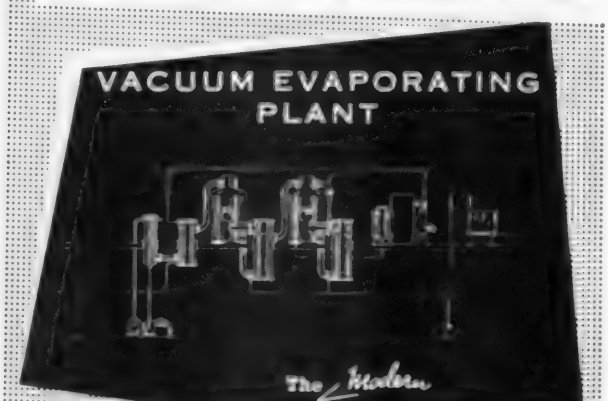

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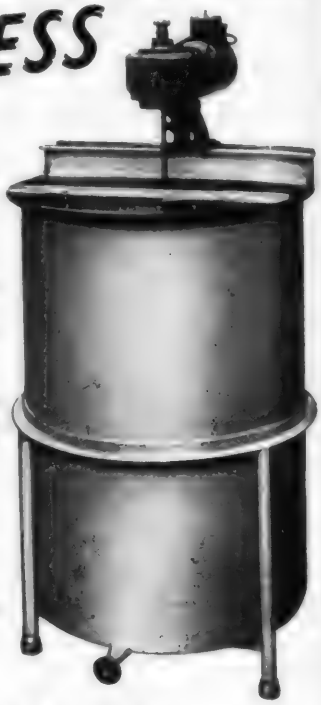

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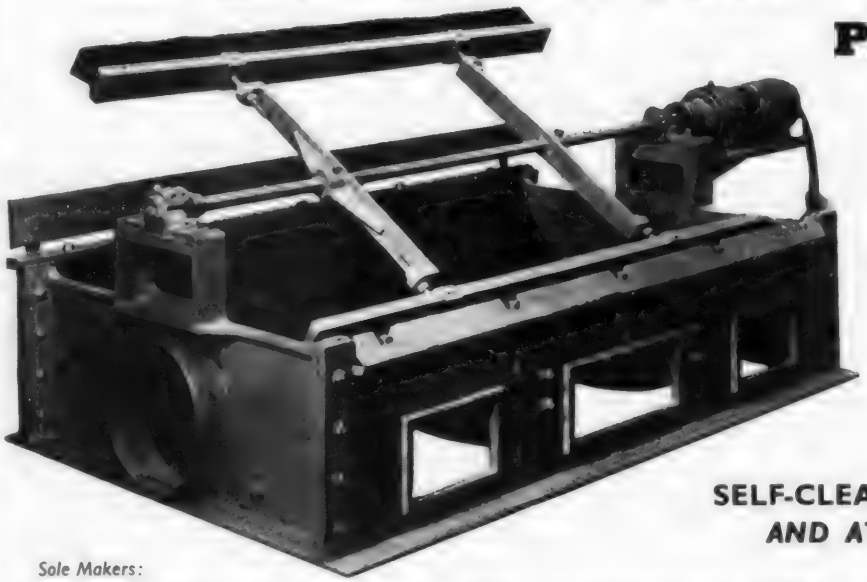

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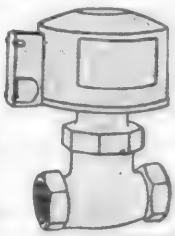

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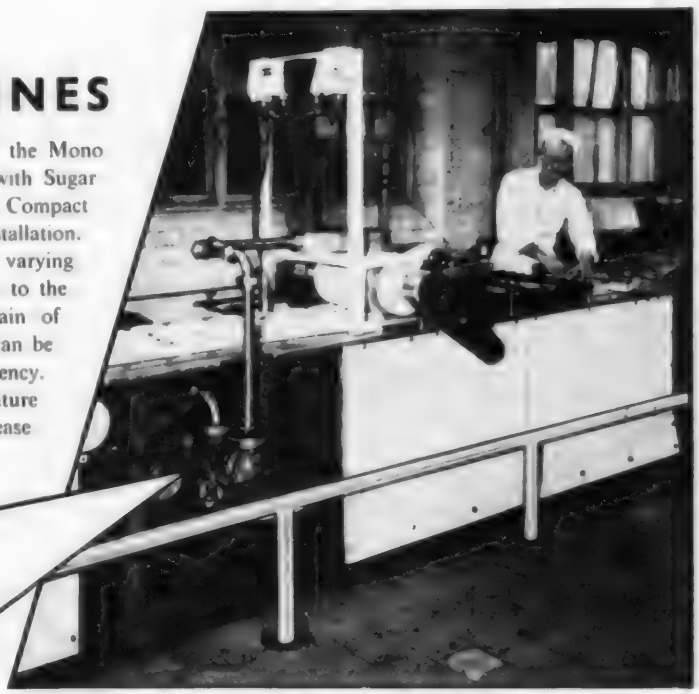

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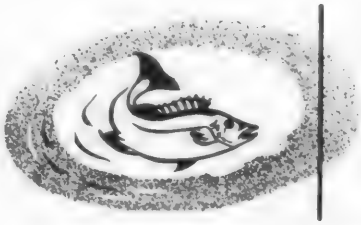

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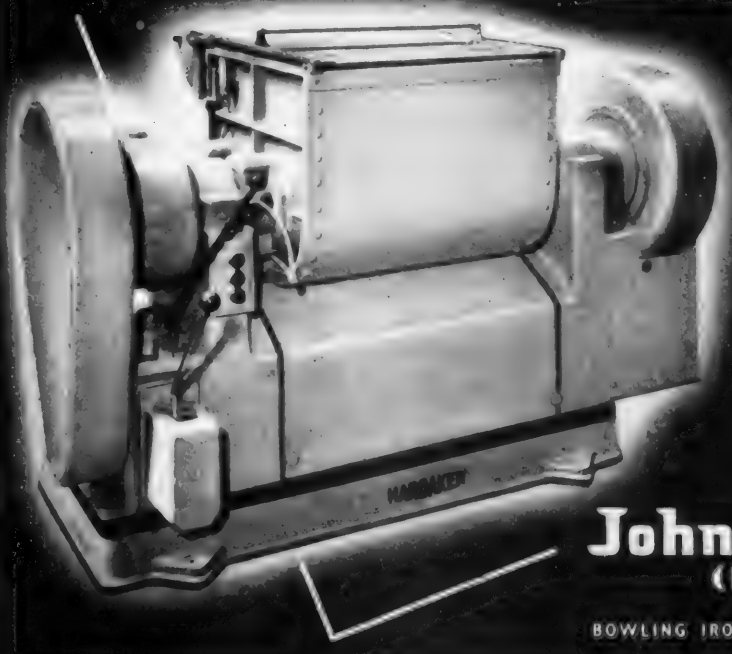

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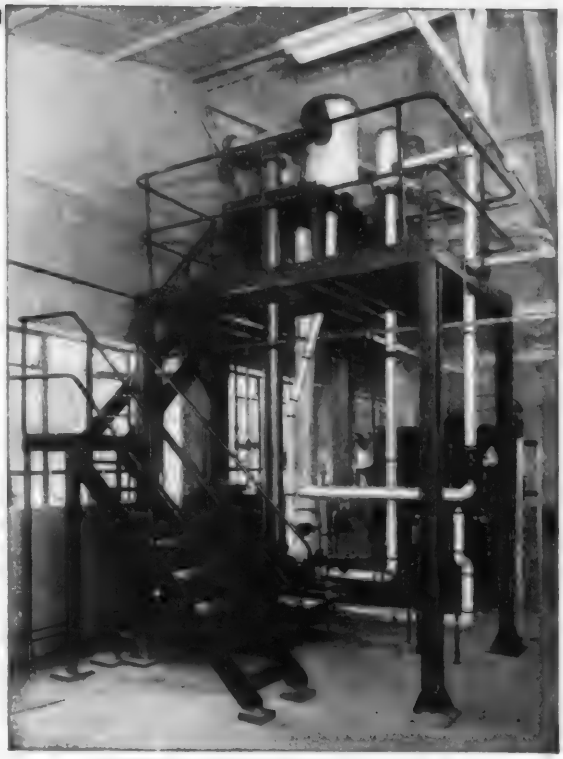

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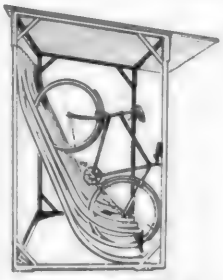

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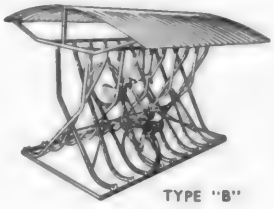

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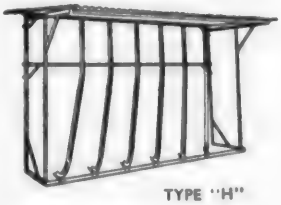

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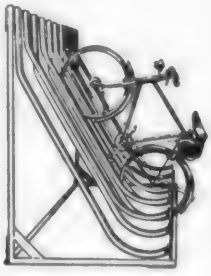

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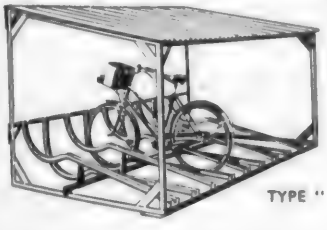

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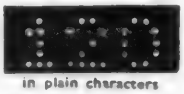

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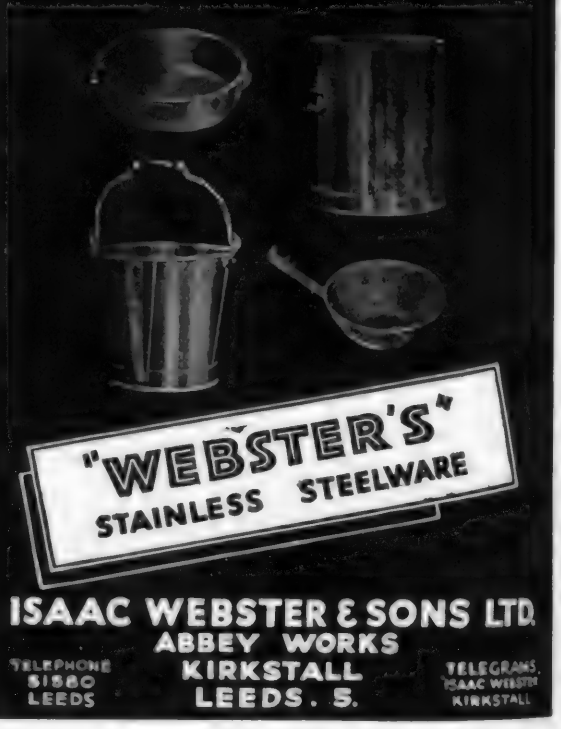

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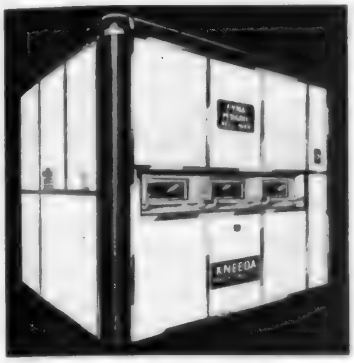

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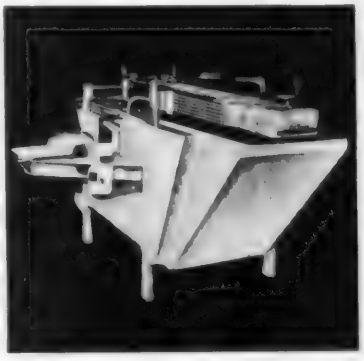

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Phenolic Resins	14/20 ,,	10/20 ,,
Dyestuffs	10/20 ,,	20 ,,
Flour	30/40 ,,	70/80 ,,
Kaolin	12/20 ,,	30 ,,
Polyvinyl Chloride Resin	11/18 ,,	10 ,,
Soap Powder	19/30 ,,	70/80 ,,
Cement	14/20 ,,	20/30 ,,
Tungstic Acid	10/15 ,,	2/5 ,,
Magnesium Trisilicate	4/8 ,,	20/30 ,,

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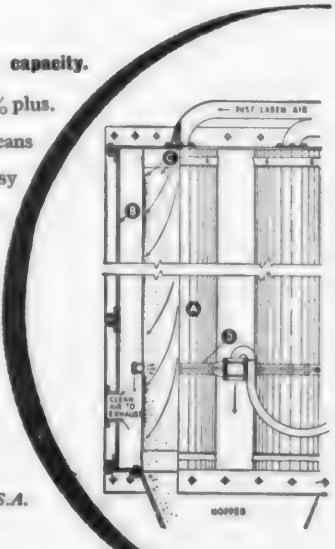

Diagram showing operation of the MIKRO-FIL UNIT — *Felt Bag (A) is clamped in housing (B). Dust-laden air enters from top (C). As the air passes through filter medium, dust deposited on inner surface of bag is dislodged by dual-action of cleaning ring (D). Cleaning is accomplished by counter-current of pressured air from ring and flexing of bag by ring as it moves up and down continuously.*

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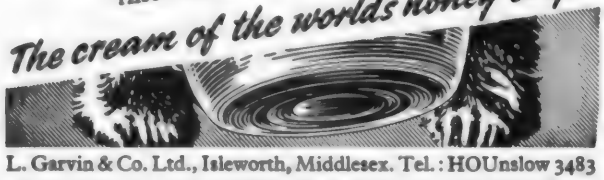

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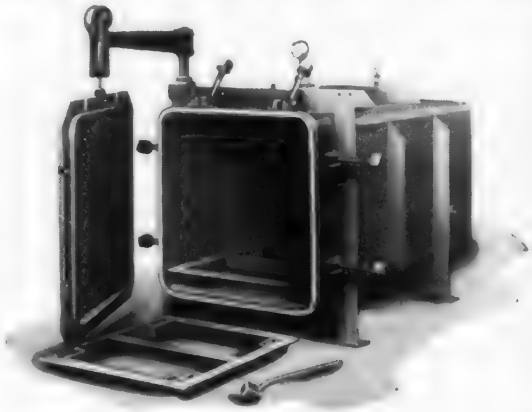

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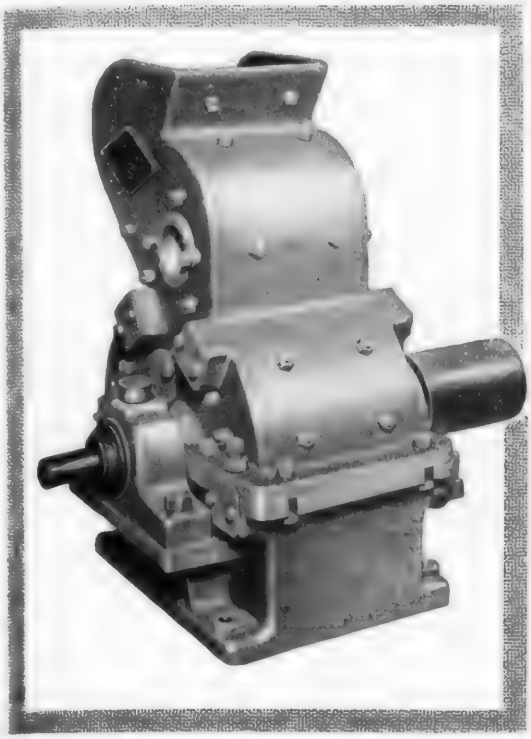

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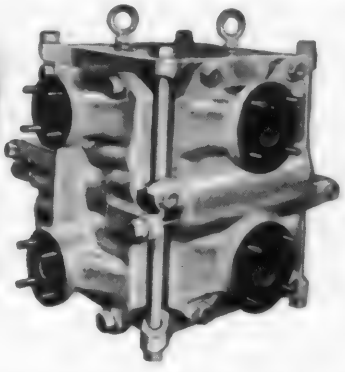

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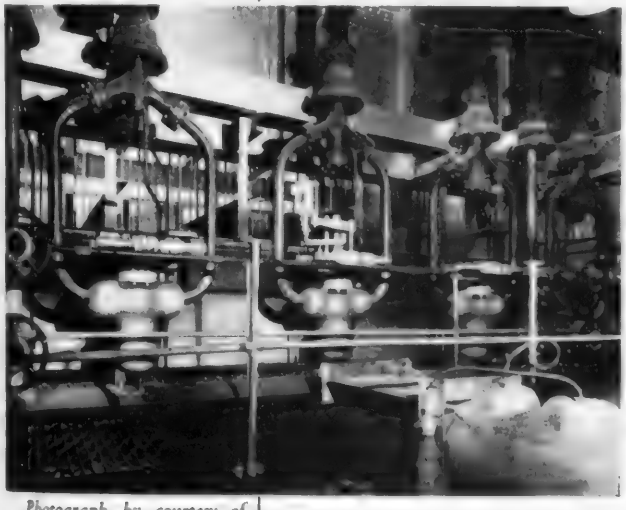

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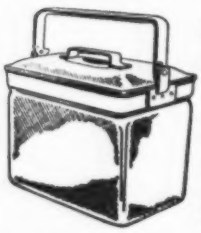

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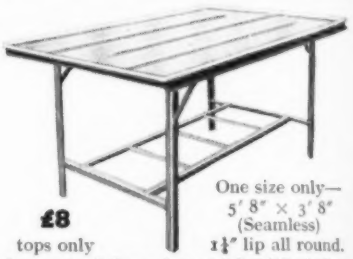

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KELLIE 9½ in. stainless steel Pulping and Sieving Machine, complete with $\frac{1}{16}$ in. mesh screen. Swallow 25 in. diam. Bowl Chopping Machine latest type with self-contained motor drive.—Details from Box B5089.

BOTH Automatic All Round Can Labelling Machine, motorised A.C. 400/440v./3/50. Capacity up to 200 cans per min. and at present set to handle 8 oz. cans. Completely reconditioned and guaranteed. Immediate delivery. —Apply C. Skerman and Sons Ltd., 118, Putney Bridge Road, London, S.W.15. Vandyke 2406.

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"HOBART" 20-quart Bowl Mixer motorised. "Peerless" 20-quart Bowl Mixer motorised. "Melvin" 80/40-quart Bowl Mixer, belt. "Croli" Flour Mixer and Sifter motorised. "Berkel" Bread Slicer, motor driven.—Welding's, Saxone Bdgs., Tarleton Street, Liverpool, 1.

ONE Newman pressure cooker. One 150-lb. oil pressure sausage filler. One 60-lb. Wetter chopping machine. One sausage cooling tunnel, as new, output 800 lb. per hr. 1,000 bacon hooks, 12 in.—Apply G. Brazil and Co. Ltd., London Road, Amersham.

250 and 500 gall. Stainless Steel Tanks with agitators; Benhil Butter and Margarine Packer; Pasteuriser; Ovens; Mixers; Kneaders; etc. Your enquiries welcomed.—Sorensen Bakery Equipment Ltd., 42, Raby Street, Manchester 16. Tel.: Moss Side 2054. 'Grams: Rahbek.

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"ROMA" sausage linking machine. This machine is practically new, and is offered for quick sale at a reasonable price.—Offers to R. Henshall Ltd., Aitkin Street, Warrington, Lancs.

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TWO excellent Gardner 5-cwt. size Combined Sifting and Mixing Machines, and one 3-cwt. size. One revolving drum-type Horizontal Mixer, 3 ft. 9 in. long, 6 ft. 4 in. diam., and 7 h.p. A.C. motor. Can be used for tea, dry powders, granular materials, seeds, etc.,—Frank Stacey and Co. Ltd., Vauxhall Street, Birmingham, 4.

PURDY Uni-Turret Fully Automatic Bottle Labelling Machine type "C" motorised with variable speed drive and complete with labelling parts for 5 and 7 oz. square bottles. Capacity 60/80 bottles per min. Also Autopack Automatic Bag Feeding, Filling and Sealing Machine, adjustable for packets size 1¾ in. by 3 in. up to 4½ in. by 6½ in. capacity 50/80 bags per min. Both machines purchased new 1949, little used and in perfect condition. Inspection Nottingham.—Apply Box B5088.

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Trough Mixer by Werner Pfleiderer, twin Z blades. Trough 2 ft. 8 in. by 2 ft. 8 in. by 2 ft. 2 in. Hand tilting.

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Automatic Bottle Labelling Machine by Peters, Slough. Capacity bottles up to 10 in. high, singly 4 in. wide, in pairs 2 in.; 60 per min. singly, 120 per min. pairs. Motorised 400/3/50.

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ONE Second-hand Hesser Automatic Packeting Machine capable of producing 40 cartons per minute of size 7¾ in. high by 3¾ in. face by 3¾ in. side aniline printed in two colours from plain cardboard reel. The machine built on compact stiff frame delivers the packages completely made, printed, filled by automatic weighers and sealed with glue. Discharge of packages is by conveyor belt with top pressure belt to ensure sealed tops. Various automatic stopping devices and stop buttons on both sides of the machine are incorporated. May be seen in use.—Apply Box B5087.

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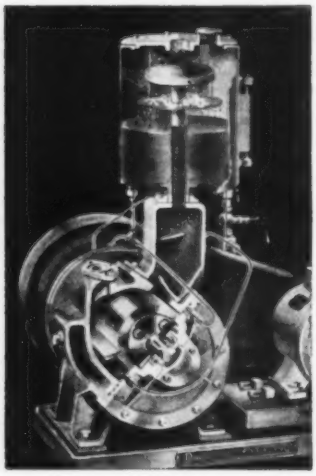

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